

VF66B

*TOYO
INTELLIGENT
INVERTER*



Operating Manual

~ Induction Motor Vector Control Mode ~

Foreword

Thank you for choosing TOYO inverter product. This instruction manual is for TOYO VF66B inverter FULL mode (Induction motor vector mode). Before using TOYO VF66B inverter in Induction motor vector mode, please read a set of instruction manuals (Installation, Basic operation, Trouble shooting and Maintenance) to get familiarize with the feature of TOYO VF66B inverter and use this manual for those functions which are not covered in an instruction manual (basic operation edition).

TOYO VF66B inverter has many special features in addition to basic function in order to accommodate wide variety of applications and maximize performance of the system. For the special feature of VF66B, please refer to the value stated in the dedicated instruction manuals or test data report.

Please read before use

For safety

Before installing, operating, maintaining and inspecting the inverter, please read this manual and all other appendices thoroughly in order to get familiarize with the feature of the inverter, safety information and correct handling. In this manual, the safety instructions are classified in to two levels: DANGER and CAUTION. These signs have important instructions.

Please follow the instructions without fail.



Indicates a hazardous situation which may result in death or serious injury if it is handled improperly.



Indicates a hazardous situation which may result in moderate or minor injury or only in property damage if it is handled improperly. However, such a situation may lead to serious consequences depending on circumstances.

CAUTION [Installation]

- Install the inverter on a metallic or non-flammable surface.
Otherwise, it may cause a fire.
- Do not place flammable materials near the inverter.
Doing so may cause a fire.
- Do not carry the inverter by the front cover.
The inverter may drop and cause personal injury.
- Install the inverter on the surface that withstands its weight.
Otherwise, it may drop and cause personal injury.
- Do not install or operate the inverter if it is damaged or have any of its parts missing.
Operating the inverter in such a state may cause personal injury.

DANGER [Wiring]

- Before wiring, make sure the power is OFF.
Failure to do so may cause an electric shock or a fire.
- Make sure to connect grounding wire.
Failure to do so may cause an electric shock or a fire.
- Wiring must be done by skilled technicians.
Wiring by unauthorized persons may cause an electric shock or a fire.
- Wire the inverter after it is installed.
Failure to do so may cause an electric shock or a fire.

CAUTION [Wiring]

- Do not connect AC power to the output terminals (U, V or W).
Doing so may cause an injury or a fire.
- Make sure that the rated voltage of the device is conformed to the voltage of AC power.
If not, injury or a fire may occur.
- Do not connect a resistance directly to the DC terminal +1or between +2 and - or +1 and +2.
Doing so may cause a fire.
- Connect a designated ground-fault protection relay or ground-fault breaker to the inverter input R, S and T for ground-fault protection.
Failure to do so may cause an electric shock or a fire.

DANGER [Operation]

- Turn the power ON after fitting the front cover. Do not remove the cover while the power is ON.
Failure to do so may cause an electrical shock.
- Do not operate any switch with wet hands.
Failure to do so may cause an electrical shock.
- Do not touch the inverter terminals while the power is ON even if the inverter is in the idle state.
Failure to do so may cause an electrical shock.
- The stop button is effective only when the use of its function has been set. Provide a separate emergency stop button.
There is possibility of personal injury.
- If the alarm is reset with the operation signal kept input, the inverter will suddenly restart. Reset the alarm after making sure that the operation signal is OFF.
Failure to do so may cause personal injury.

CAUTION [Operation]

- The radiating fin and the radiating resistance are hot. Do not touch them.
There is a risk of burn.
- The inverter can be set to operate in a wide range of speed. Operate the inverter after sufficiently checking the allowable range of the motor and equipment.
Failure to do so may cause personal injury.
- If a holding brake is necessary, provide it separately.
Failure to do so may cause personal injury.

DANGER [Maintenance, inspection and parts replacement]

- Before inspecting the inverter, turn the power OFF, and wait for 10 minutes or more to make sure that the motor is stopped.
Check the DC voltage between +1 and - or +2 and - to confirm that the voltage is 30V or less.
Failure to do so may cause an electric shock or a fire.
- Check that the rated voltage of the device is conformed to the voltage of AC power.
If not, personal injury or a fire may occur.
- Unauthorized persons shall not perform maintenance or inspection of the inverter or part replacement. Use insulated tools for maintenance and inspection.
Failure to do so may cause an electrical shock or a personal injury.

DANGER [Other]

- Never modify the inverter.
Doing so may cause an electrical shock or personal injury.

CAUTION [General precautions]

Some illustrations given in this manual show the inverter from which the covers or safety shields have been removed to illustrate the details. Before operating the inverter, reinstall the covers and shields to their original positions and operate the inverter according to this manual.

These safety precautions and specifications stated in this manual are subject to change without notice.

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Chapter1 FULL mode

1.1. Feature of FULL mode

This inverter has total of 16 areas from A through S areas as described in table below. Unlike the SIMPLE mode, which only the parameter of limited area can be displayed/changed, in the FULL mode, all parameter of all area can be displayed/changed.

* If setting change is made in the FULL mode and then return to the SIMPLE mode, the items indicated by “○” in “Default value when operated in SIMPLE mode” column will be set to default value. However, if areas C through P are set in the FULL mode and change the mode to SIMPLE mode once and then back to the FULL mode again, the values previously set in the FULL mode will be selected for the areas C through P.

Set area	Description	SIMPLE mode	Distinguishable between 1st set up block and 2nd set up block ¹⁾	Default value when operated in SIMPLE mode	Remarks
Basic	Speed setting Jog speed setting Acceleration/deceleration time (1) and (2) Speed control PI gain and etc.	○	○		
A	Max. speed Motor rating, with/without PG Motor constant	○	○		
b	Rewrite protection Stop mode and its speed Instantaneous power failure/ reverse prohibition Operation/Jog/rotation speed command input place select Torque limit	○	○		
c	Contact input (multi-function input) function selection		△	○	Standard terminal can be selected
d	Acceleration/deceleration time (3) and (4), and S-pattern acceleration/deceleration setting Preset speed Jump speed MRH related		○	○	
E	Torque command mode Regeneration stall prevention Motor temperature compensation ON/OFF Current control gain Torque control mode Simulation mode Forward direction change		○	○	
F	Over speed/over load/over torque protection related Trace back Cumulative operation timer Other protection related		○	○	
G	Analog input/output characteristics selection of optional circuit board. Temperature detection option related Line speed monitor adjustment		△	○	
H	Multi-function output selection Data related to multi-function output		○	○	
i	Built-in PLC Drooping related Operation mode (ASR/ATR/Priority) 2nd Speed control gain and etc. Speed control method selection, position setting and etc.		○	○	
J	Communication option related		△	○	
L	Vdc adjusting gain Analog input/output adjusting gain and offset SIMPLE /FULL mode selection		△		Set via S area
n	Inverter mode, inverter capacity		○		Set via S area
P	For built-in PLC		△	○	
S	Automatic measuring/initialization Cumulative operation timer reset ROM rewrite protection (Only limited portion is rewritable in SIMPLE mode)	Limited part only	△	—	Data in this area is not stored.

*1: The parameters which are distinguishable between 1st set up block and 2nd set up block are indicated by “○”, whereas common parameters are indicated by “△”.

About the SIMPLE and FULL modes

VF66B has two modes: SIMPLE mode and FULL mode.

	Description
SIMPLE mode	Only the parameters required for basic operation can be displayed/changed.
FULL mode	All parameters can be displayed/changed.

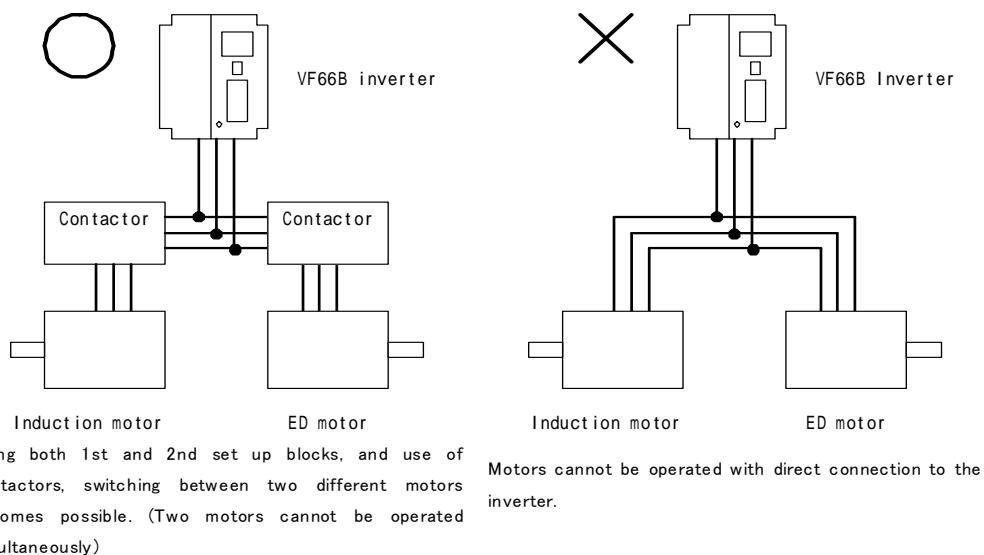
This manual describes FULL mode. For instruction for SIMPLE mode, please refer to the Operation manual (basic operation version).

About the 1st and 2nd set-up blocks

VF66B has two set up blocks 1st and 2nd; each set up block can set up inverter mode and parameter separately. VF66B permits selection of either sensor-less drive or sensed drive for one motor, or switching between two motors; ED motor and induction motor*1 (note: two motors can not be operated simultaneously). It is possible to know current usage of the set up block; 1st or 2nd, or which inverter mode out of three modes is currently used on the 1st and 2nd set up blocks by checking display on the console panel when the inverter is turned on.

*1: In case of switching between two motors, it is necessary to have contactors to switch motor wirings.

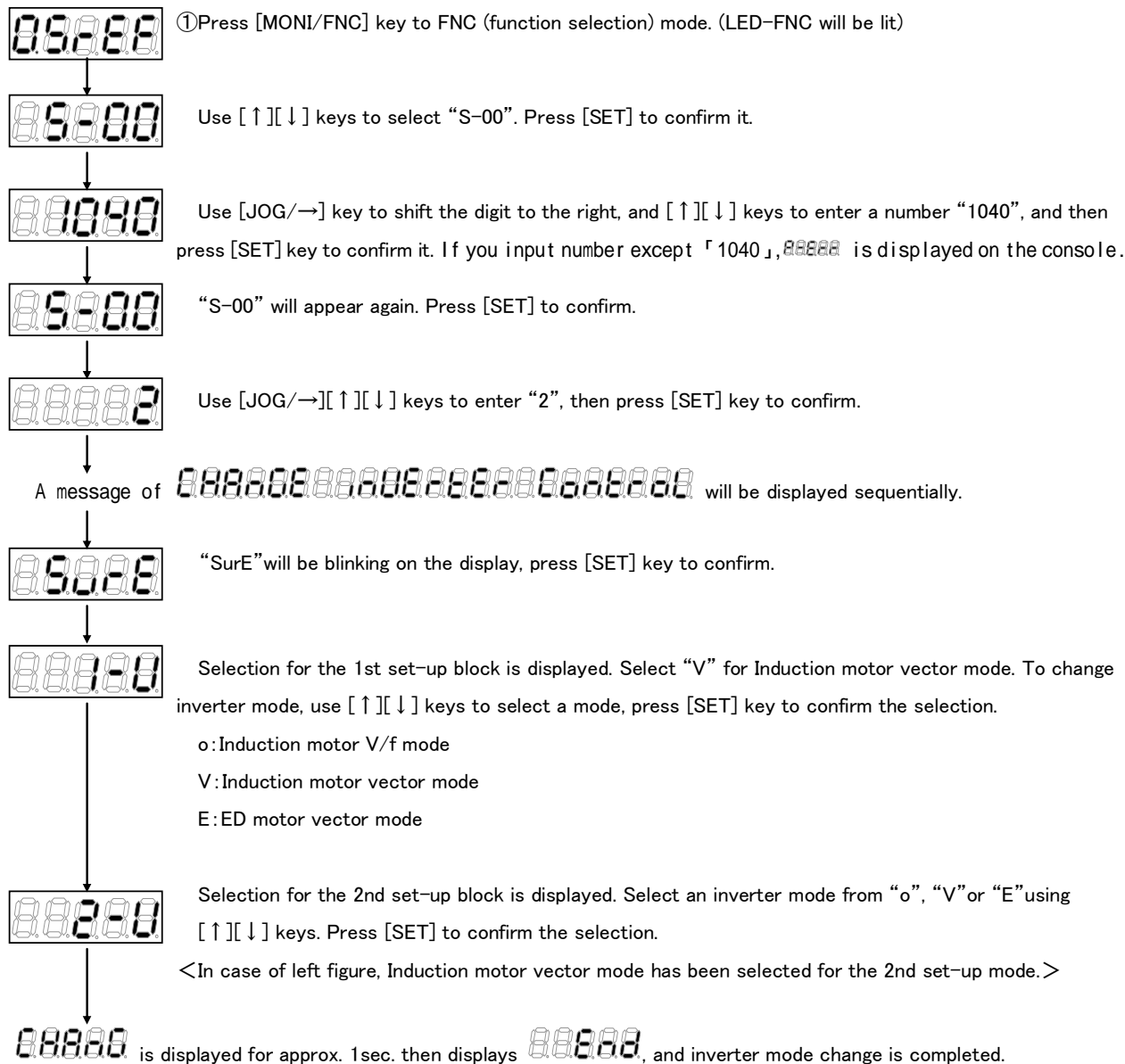
Note: For the method of switching between 1st set up block and 2nd setup block is done by external signal. Please refer to Chapter3 3.4 <C- area>, also Chapter4 4.4 <C -area> in Chapter 4.



1.2. Switching to Induction motor vector mode

A method for switching inverter mode into Induction motor vector mode is described below.

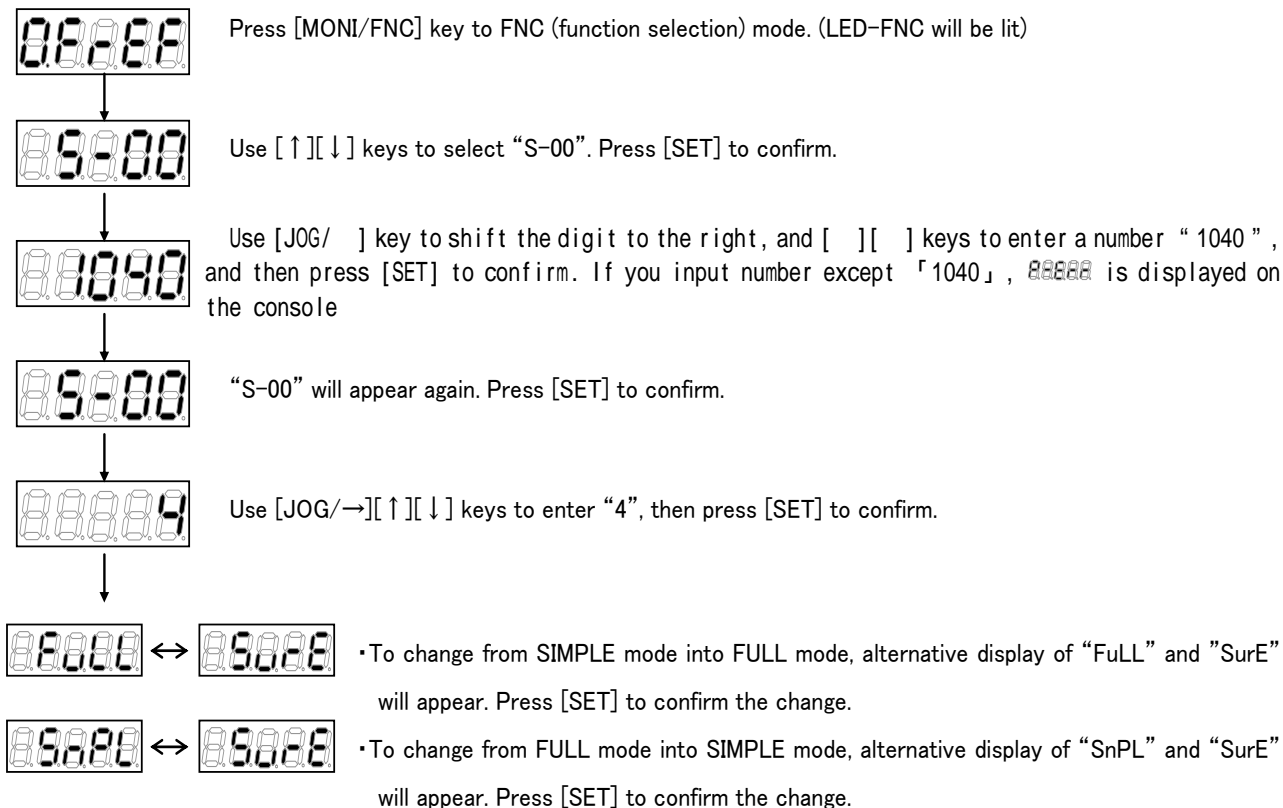
Note: This inverter has two set up blocks; 1st set up block and 2nd set up block, and user can select from them. In the default setting, 1st set up block is selected. For the switching method between 1st set up block and 2nd set up block, please refer to Chapter3 3.4 “C area” and Chapter4 4.4 “C area”.



Approx. 5sec. later, the display will return to display inverter type, capacity and voltage.

1.3. Switching to FULL mode

Method to switch between FULL mode and SIMPLE mode is described below:



Note: SIMPLE mode is selected as a factory default setting.

1.4. Automatic tuning

1.4.1. Description of automatic tuning

In the Induction motor vector mode, control is made based on the parameter of the motor, so that parameter of the motor is required. VF66B has an automatic tuning function which measures required information of the motor and set the parameter automatically. Before the operation, automatic tuning must be performed.

In the Induction motor mode, there are four automatic tunings:

- ① FULL mode automatic tuning (Forward rotation)
- ② FULL mode automatic tuning (Reverse rotation)
- ③ DC mode automatic tuning (Forward rotation)
- ④ DC mode automatic tuning (Reverse rotation)

- “Full mode automatic tuning” measures all required parameters.
- “DC mode automatic tuning” measures only part of required parameters: primary resistance and dead time compensation.

Note: Under normal conditions, perform “FULL mode automatic tuning (Forward rotation)” and “DC mode automatic tuning (Forward rotation)”. Only when each automatic tuning (Forward rotation) cannot be performed due to the relationship with load equipment etc., then each automatic tuning (Reverse rotation) should be performed.

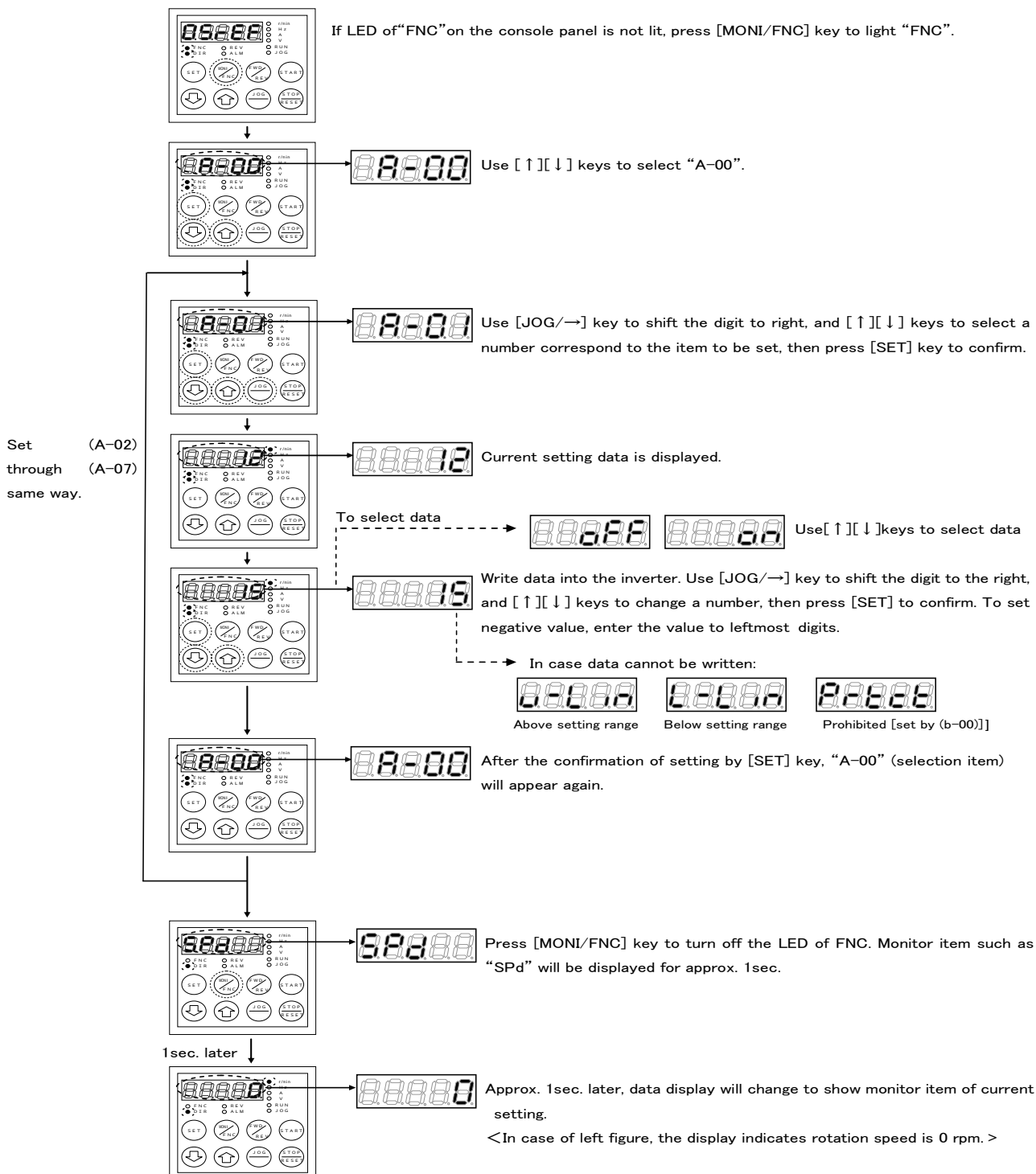
Note: When automatic tuning is performed, temperature of the motor must be cool enough (less than 25°C), otherwise due to effect on the motor characteristics, correct measurement cannot be achieved.

1.4.2. Requirement for automatic tuning

In order to perform automatic tuning, following conditions are required:

- ① The motor automatic tuning to be performed must be separated from load equipment.
- ② The motor automatic tuning to be performed must have rating of the motor.

To set motor rating, set the setting items A-00 through A-07 from the console panel (see below).



1.4.3. Procedure of automatic tuning

- Procedure for FULL mode automatic tuning

Below is a concrete procedure for FULL mode automatic tuning.



CAUTION [Relating to FULL mode automatic tuning]

Motor will turn during the FULL mode automatic tuning. Please separate the motor from load equipment and perform the tuning as a motor alone, otherwise may cause damage to the equipment or personal injury.



Press [MONI/FNC] key to FNC (function selection) mode. (LED-FNC will be lit)



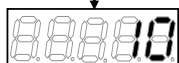
Use [↑][↓] keys to select "S-00". Press [SET] to confirm it.



Use [JOG/→] key to shift the digit to the right, and [↑][↓] keys to enter a number "1040", and then press [SET] key to confirm it. If you input number except "1040", "88888" is displayed on the console



"S-00" will appear again. Press [SET] to confirm.



Use [JOG/→][↑][↓] keys to select a mode of automatic tuning. For FULL mode automatic tuning, enter "10" (Forward rotation) or "11" (Reverse rotation). Press [SET] to confirm the selection.



⑥ An indication as on the left figure will appear showing set-up block and automatic tuning mode.

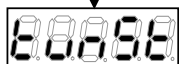
• Set-up block: '1'

• Automatic tuning mode: ' ' for FULL mode automatic tuning (rightmost is empty).

<In case of the left figure, set-up block is 1, automatic tuning mode is FULL mode>

Set-up block

Automatic tuning mode



⑦ Press [JOG/→] key to start automatic tuning.

* Motor operation when FULL mode automatic tuning (Four-pole motor)

After slowly turns about 1/2 rotation, accelerated to the speed approximately 80% of rated rotation speed.



⑧ Automatically the automatic tuning finishes. When the tuning finishes normally without problem, indication of "tunEd" will appear after the recording of measurement result. Press [STOP/RESET] key for 3 sec. to change the indication to show inverter type, capacity and voltage.

* Indication of protection of "88888" will appear if any abnormality presents. Please refer to the operation manual (trouble shooting / maintenance), Chapter2 2.1.2 <Protection display and its handling> or 2.1.4 <Description of error display when automatic tuning> for more detail.

• Press [STOP/RESET] key for 3 sec. to reset "88888" and to return to inverter type, capacity and voltage indication.

* For the detail of S-area, please refer to Chapter4, 4.16 <S-area>.

• Procedure for DC mode automatic tuning

Below is a concrete procedure for DC mode automatic tuning:



CAUTION [Relating to DC mode automatic tuning]

Motor will turn during DC mode automatic tuning in the Induction motor vector mode. In order to prevent mechanical damage, please separate the motor from the equipment or release mechanical brake so that motor can rotate freely.



Press [MONI/FNC] key to FNC (function selection) mode. (LED-FNC will be lit)



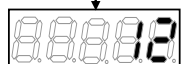
Use [↑][↓] keys to select "S-00". Press [SET] to confirm.



Use [JOG/→] key to shift the digit to the right, and [↑][↓] keys to enter a number "1040", and then press [SET] key to confirm. If you input number except 「1040」, 88888 is displayed on the console



"S-00" will appear again. Press [SET] to confirm.



Use [JOG/→][↑][↓] keys to select a mode of automatic tuning. For DC mode automatic tuning, enter "12" (Forward rotation) or "13" (Reverse rotation). Press [SET] to confirm the selection.



An indication as on the left figure will appear showing set-up block and automatic tuning mode.

•Set-up block: '1'

•Automatic tuning mode: 'd' for DC mode automatic tuning.

<In case of the left figure, set-up block is 1, automatic tuning mode is DC mode>

Set-up block

Automatic tuning mode



Press [JOG/→] key to start automatic tuning.

* Motor operation when DC mode automatic tuning (Six-pole motor)

Slowly turns to forward direction up to 2/3 rotation.



Automatically the automatic tuning finishes. When the tuning finishes normally without problem, indication of "tunEd" will appear after the recording of measurement result. Press [STOP/RESET] key for 3 sec. to change the indication to show inverter type, capacity and voltage.

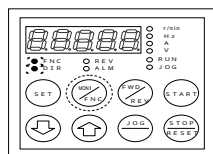
*Indication of protection or 88888 will appear if any abnormality presents. Please refer to the operation manual (trouble shooting / maintenance), Chapter2, 2.1.2 <Protection indication and its handling> or 2.1.4 <Description of error indication when automatic tuning> for more detail.

•Press [STOP/RESET] key for 3 sec. to reset 88888 and to return to inverter type, capacity and voltage indication.

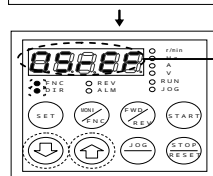
* For the detail of S-area, please refer to Chapter4, 4.16 <S-area>.

Chapter2 Parameter change from the console

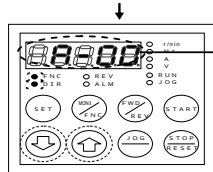
Below is a concrete procedure to change parameters from the console:



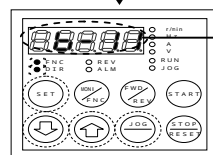
If LED of "FNC" on the console panel is not lit, press [MONI/FNC] key to light "FNC".



Basic set-up area "0.SrEF" is displayed. Use [↑][↓] keys to move to desired set-up items.



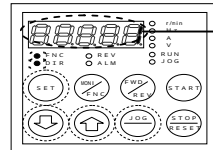
For the A through S areas, you can move to other set-up areas while alphabet part is blinking.



Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to change a parameter, then press [SET] key to confirm.

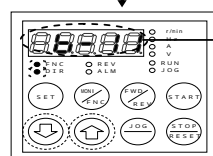
Please refer to Chapter3 <List of the Induction motor vector mode parameter> and Chapter4 <Description of the Induction motor vector mode parameters>.

<Left figure showing set up of the item "b-11" >



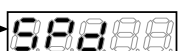
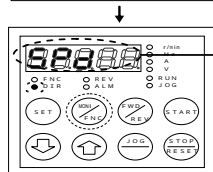
Use [↑][↓] keys to select appropriate number, press [SET] to confirm the number.

<In case of the left figure, parameter is set to "1".>



The parameter you changed is once again displayed.

<Left figure is indicating set-up of the item "b-11">



Press [MONI/FNC] key to turn off the LED of FNC. Monitor item such as "SPd" will be displayed for approx. 1sec. then the data of monitor will be displayed.

Chapter3 List of Induction motor vector mode parameter

Below are lists of parameters for Induction motor vector mode for each item in each area.

* For description of each parameter, please refer to Chapter4, <Description of Induction motor vector mode parameter>.

3.1. Basic set-up area

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
0.SrEF	Speed command	-Maximum speed (A-00) to Maximum speed (A-00)	0	r/min	Y
1.FJoG	Forward JOG speed	Minimum speed (A-01) to up to 300	24	r/min	Y
2.rJoG	Reverse JOG speed	-300 to -Minimum speed (A-01)	-24	r/min	Y
3.Acc1	Acceleration time(1)	0.0 to 3600.0	30.0	sec	Y
4.dEc1	Deceleration time(1)	0.0 to 3600.0	30.0	sec	Y
5.Acc2	Acceleration time(2)	0.0 to 3600.0	0.3	sec	Y
6.dEc2	Deceleration time(2)	0.0 to 3600.0	0.3	sec	Y
7.ASrP	Speed control proportiongain(1)	3 to 50	15	-	Y
8.ASrI	Speed control integral time constant(1)	20 to 10000	40	msec	Y
9.ASrJ	Speed control system moment of inertia(1)	0 to 65535	10	gm ²	Y

3.2. A-area (Max. motor speed, motor rating, parameter setting areas)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
A-00	Maximum speed	300 to 14700	1800	r/min	N
A-01	Minimum speed	(Depends on A-10 setting) ^{*1} up to Maximum speed (A-00)	12	r/min	Y
A-02	Rated motor capacity	(Min. depends on inverter) ^{*2} up to rated capacity of the inverter [*]	0.00	kW	N
A-03	Rated motor voltage	(200V class) 70 to 230 (400V class) 140 to 460	0	V	N
A-04	Rated motor current	20% - 150% of inverter 's rated current	0.00	A	N
A-05	Rated motor speed	20% - 100% of Max.speed	0	r/min	N
A-06	Number of motor pole	2 - 12	4	Pole	N
A-07	Rated motor frequency	Rated speed × number of pole /120 to rated speed × number of pole/120+7.0	0.0	Hz	N
A-08	Number of PG-pulse	60 to 3600	600	P/R	N
A-09	PWM carrier frequency	1.0 to 6.0	6.0	kHz	N
A-10	PG selection	0:S-mode sensor-less drive 1:V-mode drive with PG (AB phase input)	0		N
A-11	DeadTime compensation (U/ phase+side)	0.00 to 9.99	0.00	μsec	N
A-12	DeadTime compensation (U/ phase-side)	0.00 to 9.99	0.00	μsec	N
A-13	DeadTime compensation (V/ phase+side)	0.00 to 9.99	0.00	μsec	N
A-14	DeadTime compensation (V/ phase-side)	0.00 to 9.99	0.00	μsec	N
A-15	DeadTime compensation (W/ phase+side)	0.00 to 9.99	0.00	μsec	N
A-16	DeadTime compensation (W/ phase-side)	0.00 to 9.99	0.00	μsec	N
A-17	Motor primary resistance	(Setting range differs depend on inverter capacity) ^{*2}	0.0 ^{*3}	mΩ	N
A-18	Motor secondary resistance		0.0 ^{*3}	mΩ	N
A-19	Motor leakage inductance		0.0 ^{*3}	mH	N
A-20	Motor mutual inductance		0.0 ^{*3}	mH	N
A-21	Motor inductance saturation coefficient(1)	0.0 to 50.0	0.0	%	N
A-22	Motor inductance saturation coefficient(2)	0.0 to 50.0	0.0	%	N
A-23	Motor core loss torque compensation	0.0 to 20.0	0.0	%	N
A-24	Motor loss coefficient(1)	0.0 to 200.0	0.0	%	N
A-25	Motor loss coefficient(2)	0.0 to 200.0	0.0	%	N

*If rated voltage of the motor is larger than 190V (200V class) / 380V (400V class), the maximum value of the setting range will be proportionally larger.

*1: The minimum value for A-01 setting is 12 when A-10=0, and 0 when A-10=1.

*2: Please refer to Chapter4 4.2 <A-area> for the minimum value for A-02, setting ranges of A-17/A-18 and A-19/A-20.

*3: For the initialization data for A-17 to A-20, the position of the decimal point will change depend on the inverter capacity.

3.3. b-area (Operation mode, operation sequence setting area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
b-00	Setting data rewrite protection	OFF (Inactive) ON (Activate protection)	OFF		N
b-01	Stop mode selection	0: Free stop 1: Deceleration stop 2: Deceleration stop with DC brake	1		Y
b-02	Stop speed	0 to 300	30	r/min	Y
b-03	DC brake operation time	0.0 to 10.0	0.0	sec	Y
b-04	DC brake gain	20.0 to 500.0	100.0	%	Y
b-05	JOG stop mode selection	0: Free stop 1: Deceleration stop 2: Deceleration stop with DC brake	0		Y
b-06	JOG stop speed	0 to 300	30	r/min	Y
b-07	Instantaneous power interruption restart	OFF (Inactive) ON (Active)	OFF		N
b-08	Reverse prohibition mode selection	0: Normal 1: Prohibition of nonconforming rotation against command 2: Reverse prohibition	0		N
b-09	Commanding place when coupled	0: Terminal block 1: Console (SET66-Z) 2: Digital communication option	1		N
b-10	Speed commanding place selection	0: Coupled 1: Analog input(1)[terminal block](AIN1) 2: Console (SET66-Z) 3: Digital communication option 4: Analog input(2)[terminal block for I066-Z option or digital communication option](AIN2) 5: (For future extension option)*1 6: Analog input(3)[I066-Z option terminal block](AIN3) 7: Built-in PLC	0		N
b-11	Operation commanding place selection	0: Coupled 1: Terminal block 2: Console (SET66-Z) 3: Digital communication option	0		N
b-12	JOG commanding place selection	0: Coupled 1: Terminal block 2: Console (SET66-Z) 3: Digital communication option	0		N
b-13	Forward powering torque limit	0 to the value depend on Rated motor current (A-04)*2	150	%	Y
b-14	Forward regenerative torque limit	- value depend on Rated motor current (A-04)*2 to 0	-150	%	Y
b-15	Reverse powering torque limit	- value depend on Rated motor current (A-04)*2 to 0	-150	%	Y
b-16	Reverse regenerative torque limit	0 to the value depend on Rated motor current (A-04)*2	150	%	Y
b-17	Analog speed command characteristic selection	0: 0 to $\pm 10V$ 1: 0 to 10V 2: 4 to 20mA	1		N
b-18	Analog speed command upper limit speed	Absolute value of Analog speed command lower limit speed (b-19) to 100.0	100.0	%	Y

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Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
b-19	Analog speed command lower limit speed	-Analog speed command upper limit speed (b-18) to Analog speed command upper limit speed (b-18)	0.0	%	Y
b-20	Analog input ZeroLimit voltage	0.000 to 1.000	0.000	V	Y
b-21	Analog output(1) characteristic selection	0: Output voltage 1: output current 2: Torque command 3: Speed 4: Speed command 5: Built-in PLC output 6: Calibration 7: Internal monitor ----- -1: 6F frequency -2: 6F speed -3: 6F calibration	1		N

*1: b-10=5 is for a future extension option. Under normal conditions, please do not use this setting.

*2: The maximum (minimum) value for torque limit will be $200 \times (\text{rated current of inverter}) / \text{the value calculated from Rated motor current (A-04)}$. However, in case if calculated value exceeds 200%, then the maximum (minimum) value will be 200%.

3.4. c-area (Multi-function input related setting area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
c-00	Multifunction input place selection	0: Terminal block 1: Digital communication option	0		N
c-01	Multifunction input terminal(1) function selection	0: Preset speed selection 1 1: Preset speed selection 2 2: Preset speed selection 3 3: Accel./decel. time selection 1 4: Accel./decel. time selection 2 5: Speed up command (MRH mode) 6: Speed down command (MRH mode) 7: Speed hold 8: S-pattern accel./decel. prohibition 9: Max. speed reduction 10: Droop control disabled 11: Speed/torque control selection 12: Forward/reverse operation command selection 13: DC brake command 14: Initial excitation command 15: External failure signal 1 (protection relay 86A enabled) 16: External failure signal 2 (protection relay 86A enabled) 17: External failure signal 3 (protection relay 86A enabled) 18: External failure signal 4 (protection relay 86A enabled) 19: External failure signal 1 (protection relay 86A disabled) 20: External failure signal 2 (protection relay 86A disabled) 21: External failure signal 3 (protection relay 86A disabled) 22: External failure signal 4 (protection relay 86A disabled) 23: Trace back external trigger 24: 2nd set-up block selection 25: Emergency stop (B contact) 26: No function 27: Speed commanding terminal block selection 28: No function 29: Operation command [reverse] (STARTR) 30: Jog command [forward] (JOGF) 31: Jog command [reverse] (JOGR) 32: Emergency stop (A contact) 33: Protection reset (RESET) 34: External signal input 1 35: External signal input 2 36: External signal input 3 37: External signal input 4	29		N
c-02	Multifunction input terminal(2) function selection		30		N
c-03	Multifunction input terminal(3) function selection		31		N
c-04	Multifunction input terminal(4) function selection		32		N
c-05	Multifunction input terminal(5) function selection		33		N
c-06	Multifunction input terminal(6) function selection		0		N
c-07	Multifunction input terminal(7) function selection		1		N
c-08	Multifunction input terminal(8) function selection		2		N
c-09	Multifunction input terminal(9) function selection		3		N
c-10	Multifunction input terminal(10) function selection		4		N
c-11	Multifunction input terminal(11) function selection		5		N
c-12	Multifunction input terminal(12) function selection		6		N
c-13	Multifunction input terminal(13) function selection		7		N
c-14	Multifunction input terminal(14) function selection		8		N
c-15	Multifunction input terminal(15) function selection		9		N
c-16	Multifunction input terminal(16) function selection		10		N
c-17	Multifunction input terminal(17) function selection		11		N

3.5. d-area (Acceleration/deceleration time, speed jump function, MRH function selection area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
d-00	Acceleration/Deceleration time selection	0: Accel./decel. Time (1) 1: Accel./decel. Time (2)	0		N
d-01	JOG acceleration/deceleration time selection	2: Accel./decel. Time (3) 3: Accel./decel. Time (4)	1		N
d-02	Acceleration time(3)	0.0 to 3600.0	30.0	sec	Y
d-03	Deceleration time(3)	0.0 to 3600.0	30.0	sec	Y
d-04	Acceleration time(4)	0.0 to 3600.0	30.0	sec	Y
d-05	Deceleration time(4)	0.0 to 3600.0	30.0	sec	Y
d-06	S-pattern acceleration/deceleration usage selection	OFF (not use) ON (use)	OFF		N
d-07	S-pattern rise time(1)	0.0 to 60.0	0.1	sec	Y
d-08	S-pattern acceleration reach time(1)	0.0 to 60.0	0.1	sec	Y
d-09	S-pattern fall time(1)	0.0 to 60.0	0.1	sec	Y
d-10	S-pattern deceleration reach time(1)	0.0 to 60.0	0.1	sec	Y
d-11	S-pattern rise time(2)	0.0 to 60.0	0.1	sec	Y
d-12	S-pattern acceleration reach time(2)	0.0 to 60.0	0.1	sec	Y
d-13	S-pattern fall time(2)	0.0 to 60.0	0.1	sec	Y
d-14	S-pattern deceleration reach time(2)	0.0 to 60.0	0.1	sec	Y
d-15	Preset speed(1)	-Maximum speed (A-00) to Maximum speed (A-00)	0	r/min	Y
d-16	Preset speed(2)		0	r/min	Y
d-17	Preset speed(3)		0	r/min	Y
d-18	Preset speed(4)		0	r/min	Y
d-19	Preset speed(5)		0	r/min	Y
d-20	Preset speed(6)		0	r/min	Y
d-21	Preset speed(7)		0	r/min	Y
d-22	Jump speed(1)	0 to Maximum speed (A-00)	0	r/min	Y
d-23	Jump speed(2)		0	r/min	Y
d-24	Jump speed(3)		0	r/min	Y
d-25	Jump speed(4)		0	r/min	Y
d-26	Jump speed width	0 to 300	0	r/min	Y
d-27	MRH function usage selection	OFF (not use) ON (use)	OFF		N
d-28	MRH upper limit speed	MRH lower limit speed (d-29) to Maximum speed (A-00)	300	r/min	Y
d-29	MRH lower limit speed	-Maximum speed (A-00) to MRH upper limit speed (d-28)	0	r/min	Y
d-30	Speed deviation limiting command selection	OFF (without limiting command) ON (with limiting command)	OFF		Y
d-31	Maximum deviation (positive)	0.0 to 100.0	5.0	%	Y
d-32	Maximum deviation (negative)	-100.0 to 0.0	-5.0	%	Y

3.6. E-area (Torque limit, torque command characteristics, vector control related setting area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
E-00	Regeneration stall prevention function usage selection	OFF (not use) ON (use)	OFF		N
E-01	Regeneration stall prevention voltage	(200V class) 320 to 360 (400V class) 640 to 720	340 680	V	Y
E-02	High-efficient mode usage selection	OFF (not use) ON (use)	OFF		N
E-03	Forward direction change	OFF (Forward) ON (Reverse)	OFF		N
E-04	Simulation mode	OFF (without simulated operation) ON (with simulated operation)	OFF		N
E-05	Torque command mode selection	0: % command 1: Absolute value command	0		N
E-06	Flux reinforcing rate at start	100.0 to 150.0	100.0	%	N
E-07	Current control proportion gain	40.0 to 200.0	100.0	%	Y
E-08	Current control integral gain(1)	20.0 to 500.0	100.0	%	Y
E-09	Current control integral gain(2)	20.0 to 500.0	100.0	%	Y
E-10	Motor temperature compensation	OFF (without compensation) ON (with compensation)	OFF		N
E-11	Flux-command	20.0 to 150.0	100.0	%	N
E-12	Motor cooling fan (sensor-less drive)	0: Self cooling fan 1: Forced air cooling fan	0		N

3.7. F-area (Built-in DB (dynamic brake) operation, protection function, trace back setting area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
F-00	Built-in DB(DynamicBrake) operation level	(200V class) 320.0 to 360.0 (400V class) 640.0 to 720.0	340.0 680.0	V	Y
F-01	Forward overspeed setting	0.0 to 150.0	105.0	%	N
F-02	Reverse overspeed setting	-150.0 to 0.0	-105.0	%	N
F-03	Overload protection setting	20 to 110	100	%	Y
F-04	Cumulative operation timer(1-Capacitor)	0 to 65535	Depend on inverter capacity ^{*1}	Hr	N
F-05	Cumulative operation timer(2-Fan)	0 to 65535	Depend on inverter capacity ^{*1}	Hr	N
F-06	Motor overheat protection operation selection	OFF (without protection operation) ON (with protection operation)	OFF		N
F-07	Protection relay (86A) operation selection upon power failure	OFF (without protection operation) ON (with protection operation)	OFF		N
F-08	Protection retry count setting	0 to 5	0	count	Y
F-09	External failure(1) detection delay time	0.0 to 30.0	0.0	sec	Y
F-10	External failure(2) detection delay time	0.0 to 30.0	0.0	sec	Y
F-11	External failure(3) detection delay time	0.0 to 30.0	0.0	sec	Y
F-12	External failure(4) detection delay time	0.0 to 30.0	0.0	sec	Y
F-13	Traceback pitch	0 to 100	1	msec	Y
F-14	Traceback trigger point	1 to 99	80		Y
F-15	Traceback CH1 selection	0 to 12	0		Y
F-16	Traceback CH2 selection	0 to 12	0		Y
F-17	Traceback CH3 selection	0 to 12	0		Y
F-18	Traceback CH4 selection	0 to 12	0		Y
F-19	Traceback CH5 selection	0 to 12	0		Y
F-20	Traceback CH6 selection	0 to 12	0		Y
F-21	Traceback CH7 selection	0 to 12	0		Y
F-22	Traceback CH8 selection	0 to 12	0		Y
F-23	Traceback CH9 selection	0 to 12	0		Y
F-24	Traceback CH10 selection	0 to 12	0		Y
F-25	Traceback CH11 selection	0 to 12	0		Y
F-26	Traceback CH12 selection	0 to 12	0		Y
F-27	Over torque protection function selection	OFF (without over torque protection) ON (with over torque protection)	ON		N
F-28	Over torque protect level setting	110 to 205	150	%	Y
F-29	Over torque protection operation standard torque	50 to 105	105	%	Y
F-30	Speed control error function usage selection	OFF (without speed control error function) ON (with speed control error function)	OFF		N
F-31	Speed control error detection speed width (positive)	2.0 to 30.0	5.0	%	Y
F-32	Speed control error detection speed width (negative)	-30.0 to -2.0	-5.0	%	Y

*1: Please refer to Chapter4 4.7 <F-area> for factory default data of F-04 and F-05.

3.8. G-area (Analog input/output setting area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
G-00	Temperature detection selection	0: not use 1: thermistor (TVTH66-Z, optional) 2: pt100 [thermocouple](TVPT66-Z, optional)	0	—	N
G-01	Temperature detection offset adjustment	-20.0 to 20.0	0.0	°C	Y
G-02	Temperature detection gain adjustment	50.0 to 150.0	100.0	—	Y
G-03	Analog input(2) characteristics selection	0: 0 to $\pm 10V$ 1: 0 to 10V 2: 4 to 20mA	1	—	N
G-04	Analog input(2) upper limit speed	Absolute value of Analog input(2) lower limit speed (G-05) to 100.0	100.0	%	Y
G-05	Analog input(2) lower limit speed	-Analog input(2) upper limit speed (G-04) to Analog input(2) upper limit speed (G-04)	0.0	%	Y
G-06	Analog input(3) characteristics selection	0: 0 to $\pm 10V$ 1: 0 to 10V 2: not use 3: Pulse train (0[Hz] to 150[kHz])	1	—	N
G-07	Analog input(3) upper limit speed	Absolute value of Analog input (3) lower limit speed (G-08) to 100.0	100.0	%	Y
G-08	Analog input(3) lower limit speed	-Analog input(3) upper limit speed (G-07) to Analog input(2) upper limit speed (G-07)	0.0	%	Y
G-09	Analog output(2) characteristics selection	0: Output voltage 1: Output current 2: Torque command 3: Motor speed 4: Motor speed command 5: Built-in PLC output 6: Calibration 7: Internal monitor	1	—	N
G-10	Analog output(3) characteristics selection	0: Output voltage 1: Output current 2: Torque command 3: Motor speed 4: Motor speed command 5: Built-in PLC output 6: Calibration 7: Internal monitor 8: Output voltage (4 to 20mA) 9: Output current (4 to 20mA) 10: Torque command (4 to 20mA) 11: Motor speed (4 to 20mA) 12: Motor speed command (4 to 20mA) 13: Built-in PLC output (4 to 20mA) 14: Calibration (12mA output)	0	—	N
G-11	Analog input(4) characteristics selection	0: 0 to $\pm 10V$ 1: 0 to 10V 2: 4 to 20mA	1	—	N
G-12	Analog input(5) characteristics selection	0: 0 to $\pm 10V$ 1: 0 to 10V 2: not use 3: Pulse train (0[Hz] to 150[kHz])	1	—	N

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Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
G-13	Analog output(4) characteristics selection	0: Output voltage 1: Output current 2: Torque command 3: Motor speed 4: Motor speed command 5: Built-in PLC output 6: Calibration 7: Internal monitor	2	—	N
G-14	Analog output(5) characteristics selection	0: Output voltage 1: Output current 2: Torque command 3: Motor speed 4: Motor speed command 5: Built-in PLC output 6: Calibration 7: Internal monitor 8: Output voltage (4 to 20mA) 9: Output current (4 to 20mA) 10: Torque command (4 to 20mA) 11: Motor speed (4 to 20mA) 12: Motor speed command (4 to 20mA) 13: Built-in PLC output (4 to 20mA) 14: Calibration (12mA output)	3	—	N
G-15	Line speed monitor adjustment	0.0 to 2000.0	0.0	—	Y
G-16	Analog input monitor display selection	1: Analog input (1) [AIN1] 2: Analog input (2) [AIN2] 3: Analog input (3) [AIN3] 4: Analog input (4) [AIN4] 5: Analog input (5) [AIN5]	1	—	Y

3.9. H-area (Multi-function output setting area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
H-00	Multifunction output terminal(1) function selection	0: not used	7		N
H-01	Multifunction output terminal(2) function selection	1: Motor speed detection (1) (Motor speed = detection setting)	1		N
H-02	Multifunction output terminal(3) function selection	2: Motor speed detection (1) (Motor speed = detection setting)	0		N
H-03	Multifunction output terminal(4) function selection	3: Motor speed detection (1) (Motor speed = detection setting)	8		N
H-04	Multifunction output terminal(5) function selection	4: Motor speed detection (2) (Motor speed = detection setting)	2		N
H-05	Multifunction output terminal(6) function selection	5: Motor speed detection (2) (Motor speed = detection setting)	3		N
		6: Motor speed detection (2) (Motor speed = detection setting)			
		7: Reach setting			
		8: Torque detection			
		9: Torque detection (absolute value)			
		10: Power failure			
		11: Overload pre-alarm			
		12: Retrying			
		13: in reverse operation			
		14: Protection operation code*			
		15: not used			
		16: in operation			
		17: (For future extension option)*1			
		18: Timer 1 elapse			
		19: Timer 2 elapse			
		20: 2nd set-up block selected			
		21: Fan motor failed			
H-06	Speed detection(1)	—Maximum speed (A-00) to Maximum speed (A-00)	0	r/min	Y
H-07	Speed detection(2)	—Maximum speed (A-00) to Maximum speed (A-00)	0	r/min	Y
H-08	Speed detection width	0 to 600	0	r/min	Y
H-09	Torque detection (with polarity)	-205 to 205	0	%	Y
H-10	Torque detection (absolute value)	0 to 205	0	%	Y
H-11	Overload pre-alarm operation level setting	0 to 100	50	%	Y
H-12	Maximum speed reduction rate	50.0 to 100.0	90.0	%	Y

*1: Selection 17 for H-00 through H-05 is for a future extension option. Under normal conditions, please do not use this setting.

3.10. i-area (Droop control, mechanical loss compensation setting area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
i-00	PLCL function usage selection	OFF (not use) ON (use)	OFF		N
i-01	PLCH function usage selection	0: OFF (not use) 1: PLCH ON 2: PLCH ON (speed command input = PLCH output)	0		N
i-02	Droop control usage selection	OFF (not use) ON (use)	OFF		N
i-03	Droop start speed	0.0 to 100.0	0.0	%	Y
i-04	Droop rate changeover speed	0.0 to 100.0	0.0	%	Y
i-05	Droop rate	0.0 to 50.0	0.0	%	Y
i-06	Droop start torque	0.0 to 90.0	0.0	%	Y
i-07	Operation mode selection	0: Speed control (ASR) mode 1: Torque command - direction priority 2: Torque command + direction priority 3: Torque control (ATR) mode 4: Speed/torque control contact switch	0		N
i-08	Torque command input place selection	0: Analog input (1) [terminal block](AIN1) 1: Analog input (2) [IO66-Z option or digital communication option](AIN2) 2: Digital communication option 3: Built-in PLC output	1		N
i-09	Analog torque command gain	50.0 to 200.0	150.0	%	N
i-10	Speed control proportion gain(2)	3 to 100	15		Y
i-11	Speed control integral time constant (2)	20 to 10000	40	msec	Y
i-12	Speed control system moment of inertia(2)	0 to 65535	10	gm ²	Y
i-13	JOG proportion gain selection	0: Use 7 - 9 of basic setting area 1: Speed control proportion gain(2) (i-10) to Speed control system moment of inertia(2) (i-12) 2: Special mode ^{*1}	0		Y
i-14	ASR cancelation usage selection	OFF (not use) ON (use)	ON		Y
i-15	ASR feed-forward usage selection	OFF (not use) ON (use)	ON		Y
i-16	Variable structure proportion gain start speed	0.01 to 100.00	5.00	%	Y
i-17	Variable structure proportion gain minimum gain percentage	0 to 500	100	%	Y
i-18	Initial excitation selection ^{*2}	0: AC initial excitation 1: DC initial excitation	1		N
i-19	Mechanical loss compensation usage selection	OFF (not use) ON (use)	OFF		N
i-20	Mechanical loss offset amount	0 to 100	0	%	Y
i-21	Gradient of mechanical loss	0 to 100	0	%	Y
i-22	Positing speed(0)	16 to 200	100	r/min	Y
i-23	Positing speed(1)	16 to 200	100	r/min	Y
i-24	Positing acceleration time	0.1 to 10.0	0.5	sec	Y
i-25	Positing deceleration time	0.1 to 10.0	0.5	sec	Y
i-26	Creep speed	2 to 16	2	r/min	Y
i-27	Number of moving pulse within a creep period	40 to 400	40		Y
i-28	Number of stop pulse	-50 to 50	0		Y
i-29	Positioning emergency stop selection	OFF (without positing emergency stop) ON (with positing emergency stop)	OFF		N
i-30	Proportion gain for positioning	3 to 100	15		Y
i-31	Integral time constant for positioning	20 to 10000	40	msec	Y
i-32	System moment of inertia for positioning	0 to 65535	10	gm ²	Y

*1: If JOG proportion gain is selected as (i-13) = 2, then speed is controlled within the range between speed control proportion gain(2) (i-10) and Speed control system moment of inertia(2) (i-12) when speed command of 5.56% or less is used, even at other than Jog.

*2: Selectable only in Induction motor vector mode.

3.11. J-area (Digital communication option setting area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)		Default setting	Unit	Rewritable
J-00	Digital communication option selection	0: OFF 1: OPCN66-Z 2: ASYC66-Z 3: DNET66-Z 4: PBUS66-Z 5: I066-Z 6: (For future extension option)* ¹ 7: CC66-Z		0		N
J-01	ASYC66-Z/CC66-Z option baud rate	(ASYC66-Z) 0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps	(CC66-Z) 0: 156kbps 1: 625kbps 2: 2.5Mbps 3: 5Mbps 4: 10Mbps 5: 10Mbps	4		Y
J-02	OPCN66-Z option baud rate	0: 125kbps 1: 250kbps 2: 500kbps 3: 1Mbps 4: (For factory adjustment) ²		3		N
J-03	PBUS66-Z slave address	0 to 126		2		N
J-04	OPCN66-Z option input	3 to 19		14		N
J-05	OPCN66-Z option output	2 to 12		6		N
J-06	(For future extension option)	Please stay on the default value.		0		N
J-07	ASYC66-Z/OPCN66-Z transmission selection/CC66-Z version selection	(ASYC66-Z) 0: 0ms 1: 5ms 2: 10ms 3: 20ms 4: 40ms 5: 60ms 6: 100ms	(OPCN66-Z) Baud rate (J-02)[bps] 125k 250k ----- 0: 200μs 200μs 1: 200μs 200μs 2: 200μs 200μs 3: 200μs 200μs 4: 200μs 150μs 5: 200μs 100μs 6: 200μs 100μs (CC66-Z) Baud rate (J-02)[bps] 500k 1M ----- 0: 200μs 200μs 1: 200μs 200μs 2: 200μs 200μs 3: 200μs 200μs 4: 150μs 150μs 5: 100μs 100μs 6: 50μs 50μs Version Exclusive station ----- 0: 1.1 1 1: 1.1 2 2: 1.1 3 3: 1.1 4 4: 2.0(2×) 1 5: 2.0(4×) 1 6: 2.0(8×) 1	0		N
J-08	ASYC66-Z/PBUS66-Z communication mode selection	(ASYC66-Z) 0: standard mode 1: Positioning mode 1 2: positioning mode 2	(PBUS66-Z) 0: PROFIDRIVE mode 1: Factory original mode 2: Special mode	0		N
J-09	DNET66-Z output instance number setting	0: Instance No.20 1: Instance No.21 2 to 10: (Factory original communication mode)		0		N

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Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
J-10	DNET66-Z input instance number setting	0: Instance No.70 1: Instance No.71 2 to 15: (Factory original communication mode)	0		N
J-11	DNET66-Z speed scale setting	-126 to 127	3		N
J-12	DNET66-Z monitor data number setting	0 to 119	3		Y
J-13	HighSpeed response input selection	0: Communication 1: Analog input (2)(AIN2)	0		N
J-14	Date/Time data selection from communication	0: without date/time data 1: with date/time data	0		N
J-15	Connected number of outside DB(Dynamic Brake) units with communication	0 to 6	0		Y

*1: J-00=6 is for a future extension option. Under normal conditions, please do not use this setting.

*2: J-02=4 is for factory adjustment. Under normal conditions, please stay on the factory setting.

3.12. L-area (Input gain, output gain setting area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
L-00	Vdc detection gain	80.0 to 120.0	100.0	%	N
L-01	Analog input(1) gain	50.00 to 150.00	Adjusted	%	Y
L-02	Analog input(1) offset	-50.00 to 50.00	Adjusted	%	Y
L-03	Analog output(1) gain	50.0 to 150.0	Adjusted	%	Y
L-04	Analog output(1) offset	-50.0 to 50.0	Adjusted	%	Y
L-05	Analog input(2) gain	50.00 to 150.00	100.00	%	Y
L-06	Analog input(2) offset	-50.00 to 50.00	0.00	%	Y
L-07	Analog input(3) gain	50.00 to 150.00	100.00	%	Y
L-08	Analog input(3) offset	-50.00 to 50.00	0.00	%	Y
L-09	Analog output(2) gain	50.0 to 150.0	100.0	%	Y
L-10	Analog output(2) offset	-50.0 to 50.0	0.0	%	Y
L-11	Analog output(3) gain	50.0 to 150.0	100.0	%	Y
L-12	Analog output(3) offset	-50.0 to 50.0	0.0	%	Y
L-13	Analog input(4) gain	50.00 to 150.00	100.00	%	Y
L-14	Analog input(4) offset	-50.00 to 50.00	0.00	%	Y
L-15	Analog input(5) gain	50.00 to 150.00	100.00	%	Y
L-16	Analog input(5) offset	-50.00 to 50.00	0.00	%	Y
L-17	Analog output(4) gain	50.0 to 150.0	100.0	%	Y
L-18	Analog output(4) offset	-50.0 to 50.0	0.0	%	Y
L-19	Analog output(5) gain	50.0 to 150.0	100.0	%	Y
L-20	Analog output(5) offset	-50.0 to 50.0	0.0	%	Y
L-21 ^{*1}	Inverter operation mode monitor	SnPL (SIMPLE mode) FullL (FULL mode)	SnPL		N

*1: Inverter operation mode monitor (L-21) is available only for indication.

3.13. n-area (Monitor adjusting area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
n-00	Inverter control mode	o: Induction motor V/f mode V: Induction motor vector mode E: ED motor vector mode	o		N
n-01	Capacity/Voltage class	2r222 to 9022 2r244 to 31544	Equivalent to rating of inverter		N

Note: n-area is available only for displaying contents of setting items.

Rewrite of contents can be done by rewriting of inverter mode, capacity or voltage class of S-area. For the detail of S-area, please refer to Chapter3 3.16 S-area <Mode selection, analog input/output adjusting area>, also chapter4 4.16 S-area <Mode selection, analog input/output adjusting area>.

3.14. o- area (Factory adjustment area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
o-00	SpecialAdjustment	0 to 65535			Y
o-01	SpecialAdjustment	0 to 65535			Y
o-02	SpecialAdjustment	0 to 65535			Y
o-03	SpecialAdjustment	0 to 65535			Y
o-04 to o-53		These are for factory adjustment. Please stay on the factory default value.			

Note: o-area is for factory adjusting and special purpose, so that cannot be changed. No indication is displayed on the console monitor. Please stay on the factory default setting. (Error will be indicated if you attempt to write in this area.)

3.15. P-area (Built-in PLC, P resistor setting area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
P-00 to 99	P resistor constant setting	See separate booklet "User manual for VF66series PC Tool".			

3.16. S-area (Mode selection, analog input/output adjusting area)

Rewritable when in operation: Y = Yes N = No

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
S-00	Special mode selection	1: Inverter initialization 2: Inverter mode change 3: Delete protection related 4: Switching between SIMPLE mode and FULL mode 10: FULL mode auto-tuning (forward) 11: FULL mode auto-tuning (reverse) 12: DC mode auto-tuning (forward) 13: DC mode auto-tuning (reverse) 99: Inverter initialization (For factory adjustment) ^{*1} 101: Data transfer to SET66EX-Z 102: Data copy (exclude A-area) from SET66EX-Z 103: Data copy (include A-area) from SET66EX-Z 104: Data comparison with SET66EX-Z			Y
S-01	Cumulative operation timer (1) clear	1: Clearing Timer (1)			Y
S-02	Cumulative operation timer (2) clear	1: Clearing Timer (2)			Y
S-03	Vdc adjustment	Vdc value (V): Vdc detect gain adjust			N
S-04	ROM rewrite enabling switch ^{*2}	Rewriting of ROM will be possible by entering "1040" after the power is on.			N
S-05					N
S-06	Analog input (1) adjust	1: Analog input (1) offset adjustment Input analog input (1) voltage (V) × 1000: Analog input (1) gain adjustment			N
S-07	Analog output (1) adjust	1: Analog output (1) offset adjustment 2: Analog output (1) gain adjustment			N
S-08	Analog input (2) adjust	1: Analog input (2) offset adjustment Input analog input (2) voltage (V) × 1000: Analog input (2) gain adjustment			N

Induction motor vector mode

Console display	Set-up items	Set-up range (item selection)	Default setting	Unit	Rewritable
S-09	Analog output (2) adjust	1: Analog output (2) offset adjustment 2: Analog output (2) gain adjustment			N
S-10	Analog input (3) adjust	1: Analog input (3) offset adjustment Input analog input (3) voltage (V) $\times 1000$: Analog input (3) gain adjustment			N
S-11	Analog output (3) adjust	1: Analog output (3) offset adjustment 2: Analog output (3) gain adjustment			N
S-12	Analog input (4) adjust	1: Analog input (4) offset adjustment Input analog input (4) voltage (V) $\times 1000$: Analog input (4) gain adjustment			N
S-13	Analog output (4) adjust	1: Analog output (4) offset adjustment 2: Analog output (4) gain adjustment			N
S-14	Analog input (5) adjust	1: Analog input (5) offset adjustment Input analog input (5) voltage (V) $\times 1000$: Analog input (5) gain adjustment			N
S-15	Analog output (5) adjust	1: Analog output (5) offset adjustment 2: Analog output (5) gain adjustment			N
S-16	For factory adjustment				Y

Note: For the setting of S-area, first write "1040" followed by entering the function selection item within 60 second.

*1: Under normal conditions, please do not use this setting.

*2: In order to transfer the program of PLC function into ROM, ROM rewrite enabling switch is needed to be (S-04) = 1.

For detail of PLC function, please refer to <User manual for VF66 series PC Tool>.

Chapter4 Description of Induction motor vector mode parameter

Parameters for Induction motor vector mode are described for each item in each area.

4.1. Basic set-up area

In the basic set-up area, most often used basic set-up items for the operation of inverter are concentrated. In this area, operation speed setting, normal acceleration / deceleration time adjustment and etc can be set from the console.

Operation speed setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
0.SrEF	Speed command	-Maximum speed (A-00) to Maximum speed (A-00)	1	0	r/min
1.FJoG	Forward JOG speed	Minimum speed (A-01) to 300	1	24	r/min
2.rJoG	Reverse JOG speed	-300 to -Minimum speed (A-01)	1	-24	r/min

Speed command (0.SrEF):

Operation speed can be set from the console. Select “Console” as a Command input place when coupled (b-09), and so that effective when either “Coupled” or “console” is selected for the Speed commanding place selection (b-10). See Chapter4 4.3 “b-area” for more detail.

Jog speed (forward / reverse) (1.FJoG / 2.rJoG):

Set-up Jog speed for forward and reverse rotations.

Acceleration / deceleration time set-up

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
3.Acc1	Acceleration time(1)	0.0 to 3600.0	0.1	30.0	sec
4.dEc1	Deceleration time(1)	0.0 to 3600.0	0.1	30.0	sec
5.Acc2	Acceleration time(2)	0.0 to 3600.0	0.1	0.3	sec
6.dEc2	Deceleration time(2)	0.0 to 3600.0	0.1	0.3	sec

Set-up the acceleration time from 0 to the Maximum speed (A-00) and the deceleration time from the maximum speed to 0. VF66B has four different acceleration / deceleration time settings (in case of acceleration / deceleration (3) and (4), d-02 through d-05), each setting can be set or switched from outside by the multi-function input. (In the factory default, acceleration / deceleration (1)(3.Acc1, 4.dEc1) is selected for normal operation, and acceleration / deceleration (2)(5.Acc2, 6.dEc2) for Jog operation. Please refer to Chapter4 4.5 <d-area> for more detail.)

Speed control gain set-up

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
7.ASrP	Speed control proportion gain(1)	3 to 50	1	15	
8.ASrI	Speed control integral time constant (1)	20 to 10000	1	40	msec
9.ASrJ	Speed control system moment of inertia(1)	0 to 65535	1	10	gm ²

In the VF66B vector mode, speed control is achieved by MFC control which combines feed forward and cancelation by using disturbance torque observer together.

Speed control proportion gain(1)(7.ASrP):

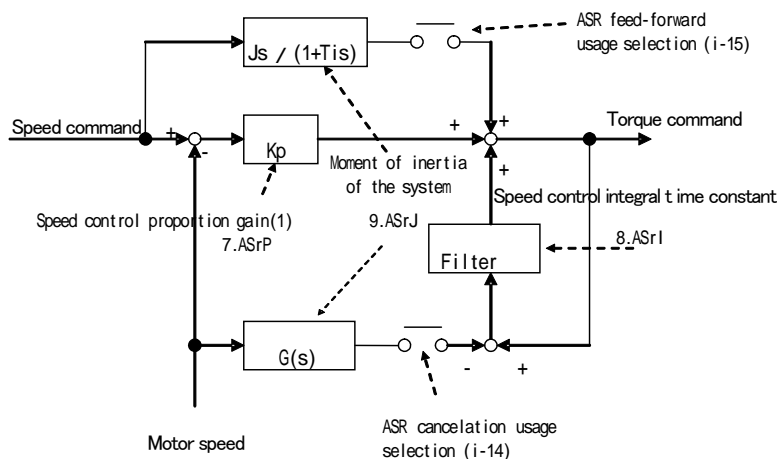
Set up the proportional gain of speed control.

Speed control integral time constant (1)(8.ASrI):

Integral gain equivalent to speed control is set at filter time constant.

Speed control system moment of inertia(1)(9.ASrJ):

Set the moment of inertia used for cancelation of speed control and feed forward in gm². Normally, 20–100% of the combined value, the value inertial moment of load converted on the motor shaft and the inertial moment of motor itself, is input. If gear noise is loud because of large backlash or vibration in the belt system, then input smaller value or inactivate cancelation and feed forward by the ASR cancelation usage selection (i-14) and ASR feed-forward usage selection (i-15) respectively.



Speed control block

*Please refer to Chapter4 4.10 “i-area” for more information.

4.2. A-area (Max.motor speed, motor rating, parameter set-up areas)

A-area is the set-up area for the motor parameter that is necessary for VF66B inverter to control the motor. Please be sure to set parameters in accordance with specification of the motor or the system before the operation of VF66B. Moreover, items A-11 through A-25 can be set automatically by automatic tuning. Combine the inverter with the motor, and carry on an automatic tuning to set the data to items A-11 through A-25 before the practical operation. Please refer to Chapter1 1.4 <Automatic tuning> for more detail of automatic tuning.

Maximum and minimum speed settings of motor

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
A-00	Maximum speed	300 to 14700	1	1800	r/min
A-01	Minimum speed	(Depends on A-10 setting)*1 to Maximum speed (A-00)	1	12	r/min

*1: The minimum setting value for A-01 will be 12 when A-10=0, and 0 when A-10=1.

The Maximum speed (A-00) sets the maximum speed (absolute value) of the motor for operation. Inverter uses this setting as 100% (reference) to control motor speed. Please set 1-4 times of the rated motor speed as the maximum speed. In case if the motor is only used below the rated speed of the motor, then set the rated speed as the maximum speed. (However, no value greater than the value equivalent to 400Hz (i.e. 12000 when 4-pole, 8000 when 6-pole) can be set.) The Minimum speed (A-01) sets the minimum speed of the motor for operation. This is an absolute value for speed control so that even if the value smaller than the minimum speed is input, it will be limited to the minimum speed. (However, when torque control mode is selected by the Operation mode selection (i-07), this will be invalidated. For more information about Operation mode selection (i-07), please refer to Chapter4 4.10 i-area.)

Setting of the indicated value on motor's rating plate

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
A-02	Rated motor capacity	(Min. value depends on inverter's rating) to rated capacity*1	Note 1	0.00	kW
A-03	Rated motor voltage	(200V class) 70 to 230 (400V class) 140 to 460	1	0	V
A-04	Rated motor current	20-150% of inverter's rated current	Note 1	0.00	A
A-05	Rated motor speed	20-100% of the max. speed	1	0	r/min
A-06	Number of motor pole	2 to 12		4	Pole
A-07	Rated motor frequency	Rated motor speed × pole number/120 to rated motor speed × pole number/120 + 7.0	0.1	0.0	Hz

*1: • Please see following table for the minimum value setting for the Rated motor capacity (A-02).

- If rated voltage of the motor is larger than 190V(200V class) / 380V(400V class), the maximum value of the setting range will be proportionally larger.

Note 1: Varies depend on inverter type.

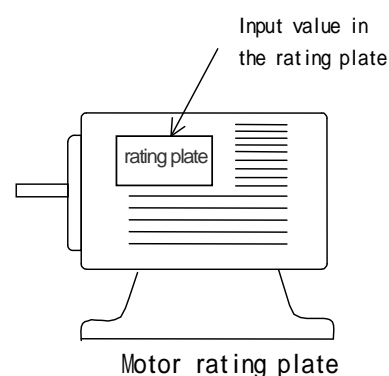
Minimum setting value for A-02

Inverter type	Minimum setting value for A-02	Inverter type	Minimum setting value for A-02
2R222	0.75	2R244	0.75
3R722	1.10	3R744	1.10
5R522	1.50	5R544	1.50
7R522	2.20	7R544	2.20
1122	3.70	1144	3.70
1522	5.50	1544	5.50
2222	7.50	2244	7.50
3022	11.00	3044	11.00
3722	15.00	3744	15.00
4522	22.0	4544	22.0
5522	30.0	5544	30.0
7522	37.0	7544	37.0
9022	45.0	11044	45.0
15022	55.0	16044	55.0
18022	75.0	20044	75.0
		25044	110.0
		31544	160.0
		40044	200.0
		50044	250.0
		60044	315.0
		75044	400.0
		100044	500.0

Set the rated value stated in the rating plates or data sheets to items A-02 through A-07. These settings are necessary for operation of the motor or for automatic tuning and therefore they must be set prior to automatic tuning. An example of a motor rating plate is shown in the right figure.

If the motor has dual rating on its rated voltage and rated current, set larger values to Rated motor voltage (A-03) and Rated motor current (A-04) within the intended speed range.

If the motor is intended to use up to its base power output, then set the base speed to the rated motor speed (A-05). It will be a constant torque control area if the speed is below the preset rated motor speed (A-05), and a constant power control area if the speed is above the preset speed (A-05).



PG pulse number setting

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
A-08	Number of PG-pulse	60 to 3600	1	600	P/R

If PG is used as a speed sensor in Induction motor vector mode, set the pulse number of the PG which is directly connected to the motor. Number of PG-pulse (A-08) is ignored when it is in a speed sensor-less vector control.

PWM carrier frequency setting

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
A-09	PWM carrier frequency	1.0 to 6.0	0.1	6.0	kHz

The modulation carrier frequency of the inverter's voltage output PWM.

In the Induction motor vector mode of VF66B, it is necessary to synchronize the cycle of torque control with carrier frequency so that if carrier frequency is changed, then control characteristics will be changed. Especially, if carrier frequency is set to below 2kHz, it slows torque control cycle and may adversely affect on the control characteristics. Under normal conditions, please set it to 6.0kHz.

PG selection

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
A-10	PG selection	0: S-mode Sensor-less drive 1: V-mode with PG (AB phase input)		0	

In the PG selection (A-10), select presence or absence of PG. In the factory default setting, A-10=0 (S-mode sensor-less drive without PG) is selected. An attached PG66 board or optional board is required for the drive with PG. Please refer to the user manual for options for more information on optional circuit board.

Items set by automatic tuning (Dead time compensation for IGBT of the inverter, primary resistance of the motor)

* Following items are the data set by automatic tuning. Please refer to Chapter1 1.4 <Automatic tuning> for more information.

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
A-11	DeadTime compensation (U phase+side)	0.00 to 9.99	0.01	0.00	μsec
A-12	DeadTime compensation (U phase-side)	0.00 to 9.99	0.01	0.00	μsec
A-13	DeadTime compensation (V phase+side)	0.00 to 9.99	0.01	0.00	μsec
A-14	DeadTime compensation (V phase-side)	0.00 to 9.99	0.01	0.00	μsec
A-15	DeadTime compensation (W phase+side)	0.00 to 9.99	0.01	0.00	μsec
A-16	DeadTime compensation (W phase-side)	0.00 to 9.99	0.01	0.00	μsec

Set the dead time compensation of IGBT of each phase in the inverter to A-11 through A-16 in order to calculate precise output voltage for control calculation. There are elements on the + and – sides of each U, V and W phase so that there are six separate dead time compensations provided for six elements. In the Induction motor vector mode, these values will be reset to 0 during initialization.

Electric constant of the motor

* Following items are the data set by automatic tuning. Please refer to Chapter1 1.4 “Automatic tuning” for more information.

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
A-17	Motor primary resistance	(Setting range and resolution differ depend on inverter capacity) *1		0.0*2	mΩ
A-18	Motor secondary resistance	(Setting range and resolution differ depend on inverter capacity) *1		0.0*2	mΩ
A-19	Motor leakage inductance	(Setting range and resolution differ depend on inverter capacity) *1		0.0*2	mH
A-20	Motor mutual inductance	(Setting range and resolution differ depend on inverter capacity) *1		0.0*2	mH
A-21	Motor inductance saturation coefficient(1)	0.0 to 50.0	0.1	0.0	%
A-22	Motor inductance saturation coefficient(2)	0.0 to 50.0	0.1	0.0	%
A-23	Motor core loss torque compensation	0.0 to 20.0	0.1	0.0	%
A-24	Motor loss coefficient(1)	0.0 to 200.0	0.1	0.0	%
A-25	Motor loss coefficient(2)	0.0 to 200.0	0.1	0.0	%

*1: Please refer to below table for the setting range of A-17 through A-20.

*2: For the initialization data for A-17 to A-20, the position of the decimal point will change depend on the inverter capacity.

Setting range of A-17 to A-20

Inverter type	A-17/A-18 setting range	A-19/A-20 setting range	Inverter type	A-17/A-18 setting range	A-19/A-20 setting range		
2R222	1 to 65535	0.1 to 3276.7	2R244	1 to 65535	0.1 to 3276.7		
3R722	0.1 to 6553.5	0.01 to 327.67	3R744				
5R522			5R544				
7R522			7R544	0.1 to 6553.5	0.01 to 327.67		
1122			1144				
1522			1544				
2222			2244				
3022	3044						
3722	3744	0.01 to 655.35	0.01 to 655.35				
4522	4544						
5522	5544						
7522	7544						
9022	11044						
15022	0.001 to 65.535	0.001 to 32.767	16044	0.01 to 655.35	0.001 to 32.767		
18022	65.535		20044				
			25044				
			31544				
			40044			0.001 to 65.535	
			50044				
			60044				
			75044				
			100044				

- Set (Motor primary resistance) + (Wiring resistance between inverter and motor) to the Motor primary resistance (A-17). Optimal value will be set by automatic tuning. This item is set by either FULL mode automatic tuning or DC mode automatic tuning. In the Induction motor vector mode, precise values are required so that it is necessary to carry on either of the automatic tuning to set the values.
- * In case if wiring distance is changed considerably after the automatic tuning, please redo the automatic tuning.
- For the Motor secondary resistance (A-18), set the primary side corresponding value of the secondary resistance (= rotor resistance) of the motor. If automatic tuning is not possible and data is needed to be set manually from the data sheet of the motor, please set the corresponding value at 25 .
- Set the leakage inductance of the motor to the Motor leakage inductance(A-19). If automatic tuning is not possible and data is needed to be set manually from the data sheet of the motor, set an average value of primary side leakage inductance and secondary side leakage inductance (primary side corresponding value).
- Set the mutual inductance of the motor to the Motor mutual inductance (A-20). Inductance will be saturated by flux, however, in this setting, set the inductance value at rated flux.
- Motor inductance saturation coefficient(1) (A-21) and Motor inductance saturation coefficient(2) (A-22) are compensation coefficient to compensate saturation of mutual inductance. Set the rate of increase against the Motor mutual inductance (A-20) in % when flux is 90% and 70% of the rated flux.
- For the Motor core loss torque compensation (A-23), set the compensation torque equivalent to core loss in the motor.
- Motor loss coefficient(1) (A-24) and Motor loss coefficient (2) (A-25) are the coefficient indicating electricity and mechanical loss measured by automatic tuning. These settings are not used for control so that no need to set in the manual setting.

4.3. b-area (Operation mode, operation sequence setting area)

Setting data rewrite protection

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
b-00	Setting data rewrite protection	OFF (Inactive) ON (Activate protection)		OFF	

When the Setting data rewrite protection (b-00) is turned ON, the data changed by SET66-Z or others will not be accepted. If data change is needed, please turn-off the Setting data rewrite protection (b-00).

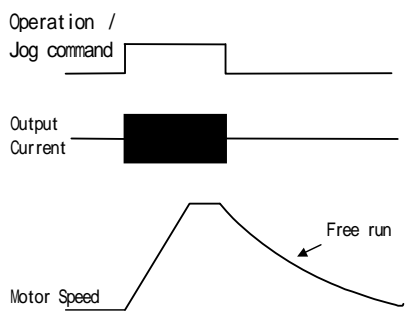
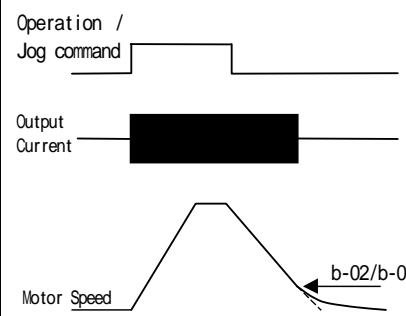
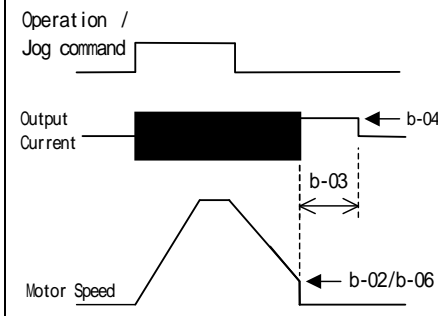
* Any attempt to rewriting data when b-00 is turned on will result in indication of **EEEE** on the console panel.

Stop mode selection

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
b-01	Stop mode selection	0: Free stop 1: Deceleration stop 2: Deceleration stop with DC brake		1	
b-02	Stop speed	0 to 300	1	30	r/min
b-03	DC brake operation time	0.0 to 10.0	0.1	0.0	sec
b-04	DC brake gain	20.0 to 500.0(rated exciting current=100%)	0.1	100.0	%
b-05	JOG stop mode selection	0: Free stop 1: Deceleration stop 2: Deceleration stop with DC brake		0	
b-06	JOG stop speed	0 to 300	1	30	r/min

Stop mode selection (b-01) and JOG stop mode selection (b-05) set the operation selection when Operation command / Jog command is turned OFF. When other than 0 (Speed control) is selected for the Operation mode selection (i-07) in the vector mode, the stop mode will be always free stop regardless of these settings. For more information on i-07 <Operation mode selection>, please refer to Chapter4 4.10 "i-area".

JOG stop speed (b-06) sets the stopping speed at Jogging.

Free stop	Deceleration stop	Deceleration stop with DC brake
Voltage output is stopped when Operation command / Jog command is turned off.	Voltage output is stopped after deceleration to the setting of the Stop speed (b-02) / JOG stop speed (b-06) in accordance with deceleration time.	DC brake is activated for the time set by the DC brake operation time (b-03) after deceleration to the setting of the Stop speed (b-02) / JOG stop speed (b-06) in accordance with deceleration time. Electric current during DC brake is set in the DC brake gain (b-04).
		

Operation selection for Instantaneous power interruption restart

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
b-07	Instantaneous power interruption restart	OFF (Inactive) ON (Active)		OFF	

Instantaneous power interruption is the period between fall of DC voltage (Vdc) to the voltage below the specified value and recovery of the DC voltage to the voltage above the specified value without causing failure in control power. In this area, select the process after the recovery of power when the operation is suspended due to instantaneous power interruption.

OFF: In this setting, operation will not resumed even though power is recovered (inverter stays on stop). To resume operation, it is necessary to turn-off the Operation command (Jog command) once, and then turn-on the command again.

ON: In this setting, operation is automatically resumed after the recovery of the power. On condition that the operation is commanded by the contact signal or by the digital communication option, the operation command to the inverter must stay ON. Start-up jam protection (StrF) will be activated if the operation cannot resumed with the operation command to the inverter is stayed ON, after the suspension of the operation.

Reverse prohibition mode selection

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
b-08	Reverse prohibition mode selection	0: Normal 1: Prohibition of nonconforming rotation against command 2: Reverse prohibition		0	

Prohibits reverse rotation.

Normal (b-08=0):

This is normal operation. No limitation on both forward and reverse rotations.

Prohibition of nonconforming rotation against command (b-08=1):

Prohibits reverse rotation against the operation command at the inverter start-up. Once the motor is started, it keeps prohibition against the reverse rotation to the operation command made at the time of inverter start-up until the inverter is turned off. Even if the forward rotation command is switched to the reverse rotation command after the start-up, the prohibition will not change unless otherwise the inverter is turned off.

	Rotation speed command to +	Rotation speed command to -
Start at forward	Forward operation	Limit to +minimum speed
Start at reverse	Reverse operation	Limit to -minimum speed

Reverse rotation prohibition (b-08=2):

Regardless of the direction of the operation command, it prohibits reverse rotation of the motor (assuming the direction of the rotation as forward rotation when the output voltage phase order of the inverter is U V W). Speed command in reversed direction is limited to +minimum speed.

Command input place selection for speed, operation and Jog commands

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
b-09	Commanding place when coupled	0: Terminal block 1: Console (SET66-Z) 2: Digital communication option		1	
b-10	Speed commanding place selection	0: Coupled 1: Analog input(1)[terminal block](AIN1) 2: Console (SET66-Z) 3: Digital communication option 4: Analog input(2)[terminal block for IO66-Z option or digital communication option](AIN2) 5: (For extension option)*1 6: Analog input(3)[IO66-Z option terminal block](AIN3) 7: Built-in PLC		0	
b-11	Operation commanding place selection	0: Coupled 1: Terminal block		0	
b-12	JOG commanding place selection	2: Console (SET66-Z) 3: Digital communication option		0	

*1: b-10=5 is for a future extension option. Under normal conditions, please do not use this setting.

Select the commanding place of the speed command, the operation command and the Jog command. These input places can be set as a batch by the setting of b-09 <Commanding place when coupled>. The input place for each command by combination the setting b-09 through b-12 is as follows:

		Commanding place when coupled (b-09)		
		0: Terminal block	1: Console	2: Digital communication option
Speed command (b-10)	0: Coupled	VFC66-Z P board [AIN1] terminal	[0.SrEF] setting	Speed command by communication
	1: Analog input(1) [terminal block](AIN1)	VFC66-Z P board [AIN1] terminal	VFC66-Z P board [AIN1] terminal	VFC66-Z P board [AIN1] terminal
	2: Console (SET66-Z)	[0.SrEF] setting	[0.SrEF] setting	[0.SrEF] setting
	3: Digital communication option	Command by communication	Command by communication	Command by communication
	4: Analog input(2) [option](AIN2)	IO66-Z option, etc.	IO66-Z option, etc.	IO66-Z option, etc.
	5: (For extension option)*1	—	—	—
	6: Analog input(3) [option](AIN3)	IO66-Z option	IO66-Z option	IO66-Z option
	7: Built-in PLC	Built-in PLC	Built-in PLC	Built-in PLC
Operation command (b-11)	0: Coupled	VFC66-Z P board •[ST-F] terminal •Set Multi-function input terminal as operation command [reverse]	Console key [START], [FOR/REV]	Operation command by communication
	1: Terminal block	VFC66-Z P board •[ST-F] terminal •Set Multi-function input terminal as operation command [reverse]	VFC66-Z P board •[ST-F] terminal •Set Multi-function input terminal as operation command [reverse]	VFC66-Z P board •[ST-F] terminal •Set Multi-function input terminal as operation command [reverse]
	2: Console (SET66-Z)	Console key [START],[FOR/REV]	Console key [START], [FOR/REV]	Console key [START], [FOR/REV]
	3: Digital communication option	Operation command by communication	Operation command by communication	Operation command by communication
Jog command (b-12)	0: Coupled	VFC66-Z P board Set Multi-function input terminal as Jog command [forward], [reverse]	Console key [JOG/→], [FOR/REV]	Jog command by communication
	1: Terminal block	VFC66-Z P board Set Multi-function input terminal as Jog command [forward], [reverse]	VFC66-Z P board Set Multi-function input terminal as Jog command [forward], [reverse]	VFC66-Z P board Set Multi-function input terminal as Jog command [forward], [reverse]
	2: Console (SET66-Z)	Console key [JOG/→], [FOR/REV]	Console key [JOG/→], [FOR/REV]	Console key [JOG/→], [FOR/REV]
	3: Digital communication option	Jog command by communication	Jog command by communication	Jog command by communication

*1: b-10=5 is for a future extension option. Under normal conditions, please do not use this setting.

When the terminal block is selected as a speed commanding place, switching of the input characteristic (selection of Voltage input 0 to $\pm 10V$, Voltage input 0 to +10V or Current input 4 to 20mA) should be done by b-17 <Analog speed command characteristic selection>. In the factory default, Voltage input of 0 to +10V is selected.

Torque limiter setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
b-13	Forward powering torque limit	0 to the value depend on Rated motor current (A-04)*	1	150	%
b-14	Forward regenerative torque limit	- the value depend on Rated motor current (A-04) to 0*	1	-150	%
b-15	Reverse powering torque limit	- the value depend on Rated motor current (A-04) to 0*	1	-150	%
b-16	Reverse regenerative torque limit	0 to the value depend on Rated motor current (A-04)*	1	150	%

Torque limit for powering and regenerative can be set in both forward and reverse rotations separately. If a torque command exceeds this setting, then torque will be limited to this setting value.

* The maximum (minimum) value for torque limit will be $200 \times (\text{rated current of inverter}) / \text{the value calculated from Rated motor current (A-04)}$. However, in case if calculated value exceeds 200%, then the maximum (minimum) value will be 200%.

Characteristic setting of the analog speed command (VFC66-Z AIN1 terminal block)

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
b-17	Analog speed command characteristic selection	0: 0 to $\pm 10V$ (bipolar) 1: 0 to 10V (monopolar) 2: 4 to 20mA		1	
b-18	Analog speed command upper limit speed	Absolute value of Analog speed command lower limit speed (b-19) to 100.0	0.1	100.0	%
b-19	Analog speed command lower limit speed	-Analog speed command upper limit speed (b-18) to Analog speed command upper limit speed (b-18)	0.1	0.0	%

Note: Analog speed command upper limit speed (b-18) and Analog speed command lower limit speed (b-19) are set in % with respect to the Maximum speed (A-00).

(For the speed commanding place selection, please refer to b-09 < Commanding place when coupled> and b-10 < Speed commanding place selection>.)

For b-17 < Analog speed command characteristics selection>, select the speed command input of either voltage input (bipolar or monopolar) or current input.

Note: When the Analog speed command characteristic selection (b-17) = 2(4 - 20mA input) is selected, please turn-on the SW1 of the VFC66-Z P-board. When the Analog speed command characteristic selection (b-17) = 0 or 1, please turn-off the SW1.

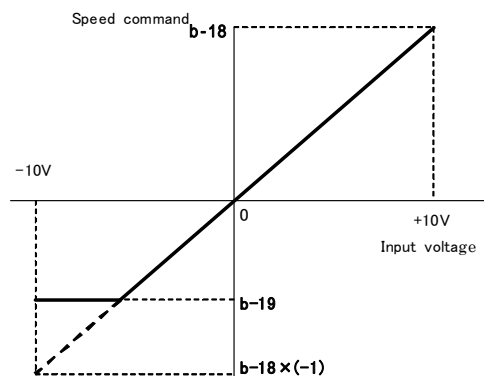
For the location of SW1, please refer to Chapter4 4.16 S-area for adjustment of Analog input(1) gain (L-01) when the input characteristic is 4 to 20mA.

In case when the Analog input (1) terminal AIN1 is used for the speed input of the VF66B

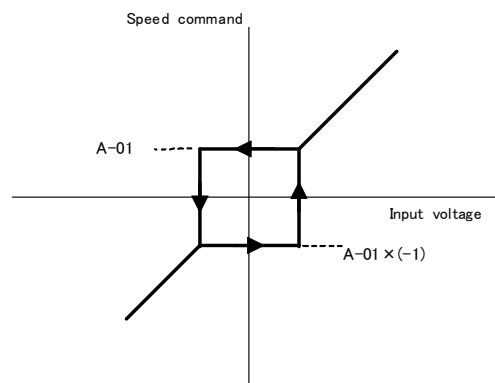
The characteristic of the speed command input by the Analog input (1) is explained below.

1) Voltage input (0 to $\pm 10V$) (b-17=0)

In Analog speed command characteristics selection b-17=0, rotation of the motor can be reversed by inputting negative voltage for the input voltage command. (In case if operation is made by reverse operation command, then the rotation will be reversed by inputting positive voltage and forward by inputting negative voltage). Analog commanding characteristic will be the setting of the Analog speed command upper limit speed (b-18) when inputting +10V, and the negative value of the Analog speed command upper limit speed (b-18) when inputting -10V. However, the negative side will be limited by the setting of the Analog speed command lower limit speed (b-19) and therefore in order to use the maximum in negative side, it is needed to set -100% in the Analog speed command lower limit speed (b-19). When the Minimum speed (A-01) is other than 0, it is limited so that the absolute value will not be less than this speed. In this case, the characteristic when passing around 0V will be the hysteresis characteristic as shown in figure below. (Speed at the start will be minimum speed in both directions; forward if started with forward operation, and reverse if started with reverse operation.)



1-1) Voltage input when (0 to $\pm 10V$)

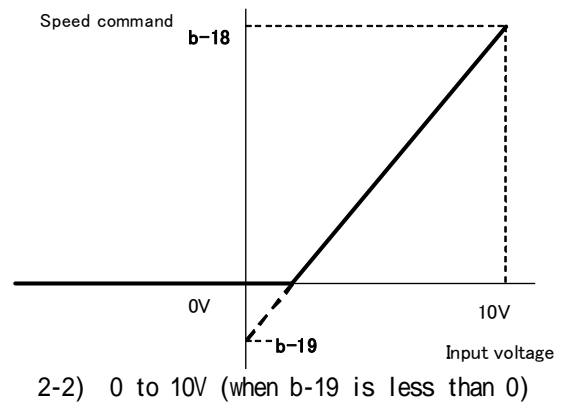
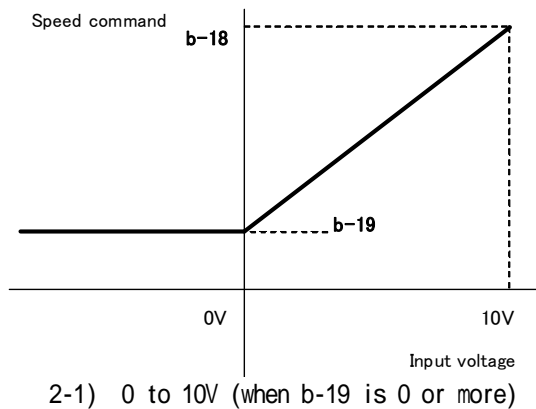


1-2) Minimum speed (A-01) hysteresis characteristic around 0 V

2) Voltage input (0 to 10V) (b-17=1)

Analog commanding characteristic will be the setting of the Analog speed command lower limit speed (b-19) when inputting 0V, and the setting of the Analog speed command upper limit speed (b-18) when inputting 10V. However, this is only effective in the positive voltage; negative side will be limited to the setting of the Analog speed command lower limit speed (b-19) or 0 in the case when negative value is selected for the Analog speed command lower limit speed (b-19).

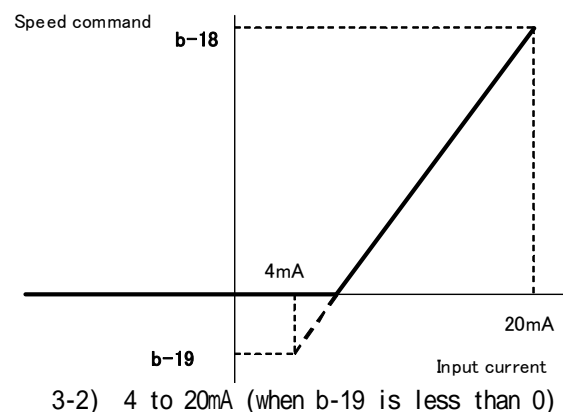
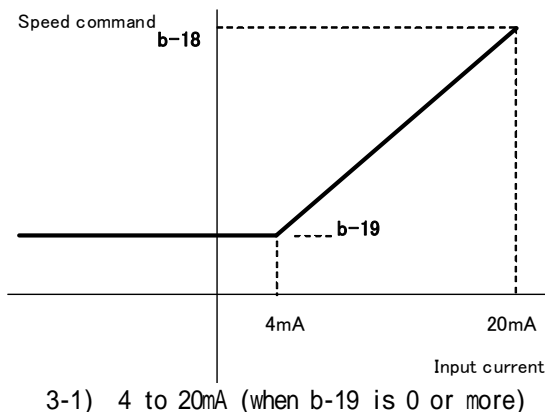
When the Minimum speed (A-01) is other than 0, it is limited so that the absolute value will not be less than this speed. As a speed command, it is for forward rotation only and should use reverse operation command for reverse rotation.



3) Current input (4 to 20mA) (b-17=2)

In Analog speed command characteristics selection b-17=2, the characteristic will be setting of the Analog speed command lower limit speed (b-19) when inputting 4mA and setting of the Analog speed command upper limit speed (b-18) when inputting 20mA. However, this is only effective in the positive current, negative side will be limited to the setting of the Analog speed command lower limit speed (b-19) or 0 in the case when negative value is selected for the Analog speed command lower limit speed (b-19).

When the Minimum speed (A-01) is other than 0, it is limited so that the absolute value will not be less than this speed. As a speed command, it is for forward rotation only and should use reverse operation command for reverse rotation.



Analog input 0 limit function setting

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
b-20	Analog input ZeroLimit voltage	0.000 to 1.000	0.001	0.000	V

This function forcibly turns the command to 0 when the absolute value of the command input voltage input in the Analog input (1) [AIN1] on the VFC66-Z P board is equal to or less than the value of this setting. This function can be used when 0 setting cannot be obtained even though 0v is set due to the causes such as drift in analog circuit. This function is effective in both speed command and torque command.

Analog output (1) characteristic selection (VFC66-Z AOT1 terminal block)

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
b-21	Analog output(1) characteristic selection	0: Output voltage 1: Output current 2: Torque command 3: Speed 4: Speed command 5: Built-in PLC output 6: Calibration 7: Internal monitor ----- -1: 6F frequency* ¹ -2: 6F speed* ¹ -3: 6F calibration* ¹		1	

Select analog output data output to the location between the terminal blocks [AOT1] and [GND1] on the VFC66-Z P board.

*1: 6F means six times (6X) of the frequency signal. If “6F speed” (b-21=-2) or “6F calibration” (b-21=-3) is selected, then the sixfold signal of the frequency corresponding value is output. Gain or offset value of the 6F output may not be adjusted.

Analog output selected by the Analog output (1) characteristic selection (b-21)

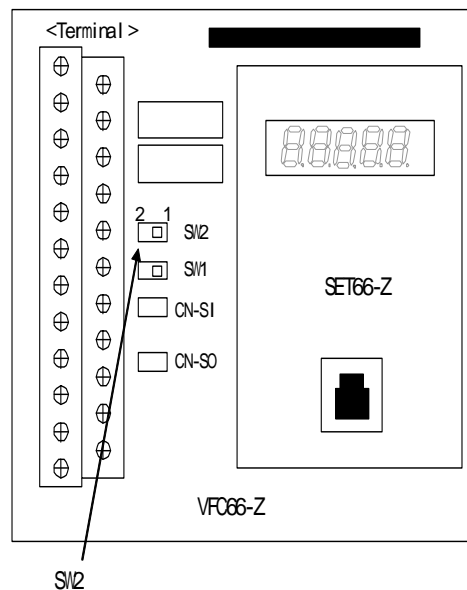
	Items	Output voltage		Items	Output voltage
0	Output voltage	7.5V / 200V (200V class) 7.5V / 400V (400V class)	4	Rotation speed command (After accel/decel control)	10V / Max. rotation speed (A-00)
1	Output current	5V / Inverter rated current	5	Built-in PLC output	5V / 20000 (100%)*
2	Torque command	5V / 100%	6	Calibration	Output 5V
3	Speed	10V / Maximum speed (A-00)	7	Internal monitor	—

* Please refer to the function manual of Control Block Editor for more detail.

6F output selected by the Analog output (1) characteristic selection (b-21)

	Items	6F Output
-1	6F frequency	Outputs sixfold frequency signal of the output frequency.
-2	6F speed	Outputs sixfold frequency signal of the corresponding value of speed.
-3	6F calibration	Outputs sixfold frequency signal of the Maximum speed (A-00) equivalent.

Note: In order to output 6F output with the Analog output (1) characteristic, switch the SW2, shown in below figure, into “1” (Console panel side).



- In case motor speed (b-21=-2) is selected:

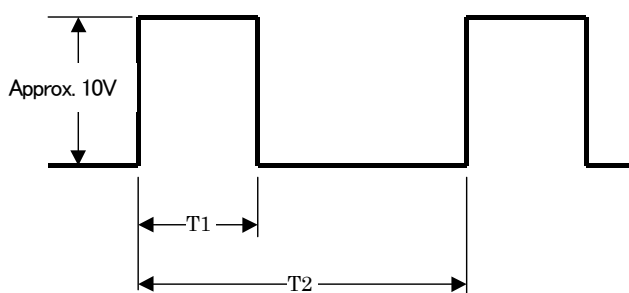
As shown in figure below, 6F signal (sixfold frequency signal of the frequency corresponding value) is output from the terminal block [AOT1]-[GND1].

When motor speed is selected, the frequency corresponding value F will be :

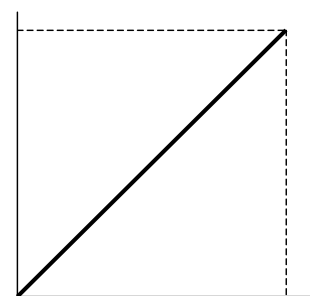
$$F = (\text{motor speed})/60 \times (\text{number of motor pole})/2(\text{Hz})$$

- In case calibration (b-21=-3) is selected:

Sixfold frequency signal of the value equivalent to the Maximum speed (A-00) is output. If digital counter type frequency/revolution indicator is used, set the pulse count in 1/6 circle. In case if DC voltmeter is used, the characteristic will be the average of 6F signal output as shown in figure below, so that adjust it accordingly. (Note: when the frequency corresponding value at the maximum speed F exceeds 120Hz, use the 1/2 of the value and when F exceeds 240Hz, then use the 1/4 of the value.)



6F signal output waveform
(Max. output current is 5mA)



Frequency - Voltage characteristic
(When F is 120Hz or less)

T1 and T2 in the figure are:

T1=1msec (Frequency corresponding value at the maximum speed F is 120Hz or less)

=0.5msec (Frequency corresponding value at the maximum speed F is 240Hz or less)

=0.25msec (Frequency corresponding value at the maximum speed F exceeds 240Hz)

T2=1/(6×F) F: output frequency or frequency corresponding value

4.4. c-area (Multi-function input related setting area)

Input signal setting for the multi-function input

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
c-00	Multifunction input place selection	0: Terminal block 1: Digital communication option		0	
c-01	Multifunction input terminal(1) function selection	0: Preset speed selection 1 1: Preset speed selection 2 2: Preset speed selection 3 3: Accel./decel. time selection 1 4: Accel./decel. time selection 2 5: Speed up command (MRH mode) 6: Speed down command (MRH mode) 7: Speed hold 8: S-pattern accel./decel. prohibition 9: Max. speed reduction 10: Droop control disabled 11: Speed/torque control selection 12: Forward/reverse operation command selection 13: DC brake command 14: Initial excitation command 15: External failure signal 1 (protection relay 86A enabled) 16: External failure signal 2 (protection relay 86A enabled) 17: External failure signal 3 (protection relay 86A enabled) 18: External failure signal 4 (protection relay 86A enabled) 19: External failure signal 1 (protection relay 86A disabled) 20: External failure signal 2 (protection relay 86A disabled) 21: External failure signal 3 (protection relay 86A disabled) 22: External failure signal 4 (protection relay 86A disabled) 23: Trace back external trigger 24: 2nd set-up block selection 25: Emergency stop (B contact) 26: No function 27: Speed commanding terminal block selection 28: No function 29: Operation command [reverse] (STARTR) 30: Jog command [forward] (JOGF) 31: Jog command [reverse] (JOGR) 32: Emergency stop (A contact) 33: Protection reset (RESET) 34: External signal input 1 35: External signal input 2 36: External signal input 3 37: External signal input 4		29	
c-02	Multifunction input terminal(2) function selection			30	
c-03	Multifunction input terminal(3) function selection			31	
c-04	Multifunction input terminal(4) function selection			32	
c-05	Multifunction input terminal(5) function selection			33	
c-06	Multifunction input terminal(6) function selection			0	
c-07	Multifunction input terminal(7) function selection			1	
c-08	Multifunction input terminal(8) function selection			2	
c-09	Multifunction input terminal(9) function selection			3	
c-10	Multifunction input terminal(10) function selection			4	
c-11	Multifunction input terminal(11) function selection			5	
c-12	Multifunction input terminal(12) function selection			6	
c-13	Multifunction input terminal(13) function selection			7	
c-14	Multifunction input terminal(14) function selection			8	
c-15	Multifunction input terminal(15) function selection			9	
c-16	Multifunction input terminal(16) function selection			10	
c-17	Multifunction input terminal(17) function selection			11	

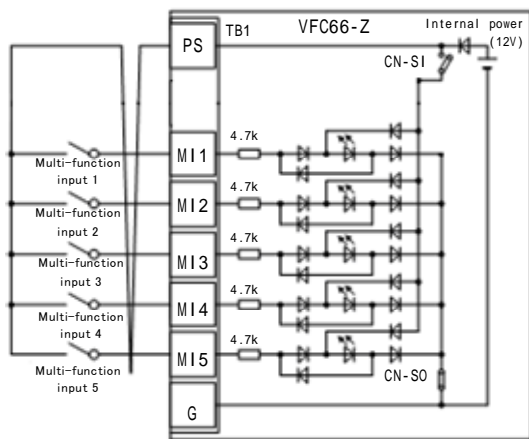
• Multi-function input terminals (1) – (5) are terminal blocks of [MI1] – [MI5] of the VFC66-Z respectively. Terminal blocks [MI6] – [MI17] of the Multi-function input terminals (6) – (17) are optional.

Induction motor vector mode

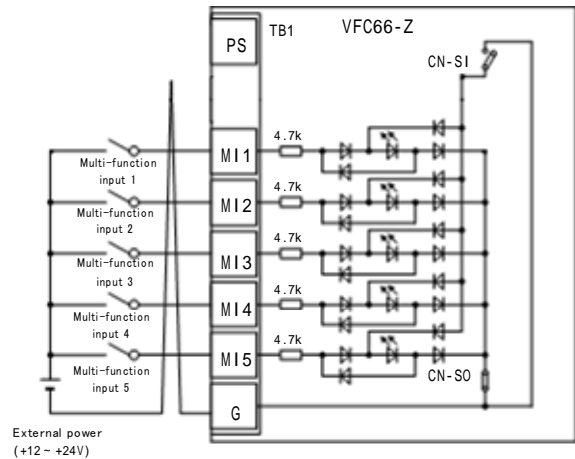
- When the Multifunction input place selection (c-00) is set to 1 [Digital communication option], and when the setting values of the multifunction input terminal function selection (c-01) – (c-17) are set to 0 (Preset speed selection 1) to 27 (Speed commanding terminal block selection), then motor will be controlled by the signal from the digital communication option. Therefore, functions of items 29 (Operation command [reverse]) to 33 (Protection reset) will be ineffective from the terminal block.

Note: If PLCL function usage selection (i-00) is turned ON, above settings are ignored and the Multi-function input terminal (1) – (5) (terminal blocks [MI1] – [MI5]) on the VFC66-Z P board and the Multi-function input terminal (6) – (17) (terminal blocks [MI6] – [MI17]) on the optional board will be the terminal for the input relay for the built-in PLC function. In this case, each function of the multi-function input will be controlled by the built-in PLC function. Moreover, if the PLCL function usage selection (i-00) is turned OFF and the PLCH function usage selection (i-01) is turned ON, then the Multi-function input terminal (4) ([MI4] terminal block) will be set to 32 (Emergency stop (A contact)) regardless of the setting of the Multi-function input terminal (4) function selection (c-04).

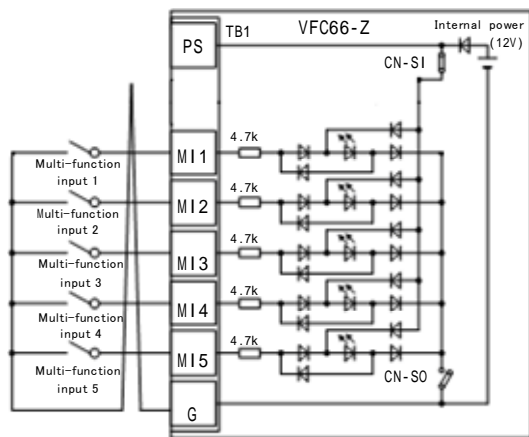
Connection of Multi-function input terminal (1) – (5)



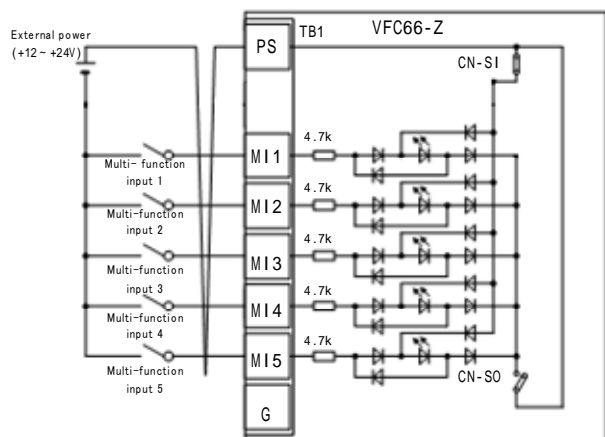
1. Source mode (with internal power source)



2. Source mode (with external power source)



3. Sink mode (with internal power source)



4. Sink mode (with external power source)

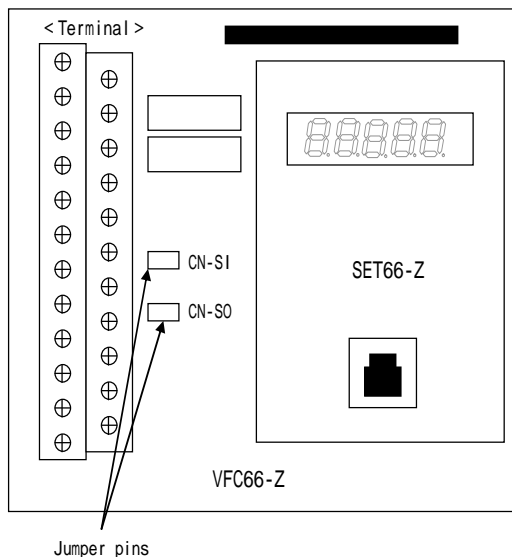
Above figures are showing typical connection of the multi-function input signal. **The maximum allowable voltage is 24V and the maximum allowable current per terminal is 3mA.**

Selection of either SOURCE mode or SINK mode is available for multi-function input signal, and either internal power source of the inverter or external power source can be selected for each mode. In the factory default, it is set to SOURCE mode. Switching between SOURCE mode and SINK mode can be done by changing jumper socket of the VFC66-Z board.



CAUTION [For your safety]

- Please make sure to turn-off the inverter before connecting terminals
There is risk of electric shock.
- Please close the front cover before turning on the inverter to avoid risk of electric shock.



<Use of [CN-S0] jumper socket with internal power source>

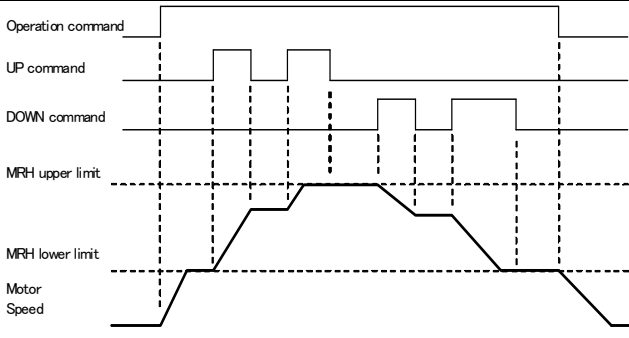
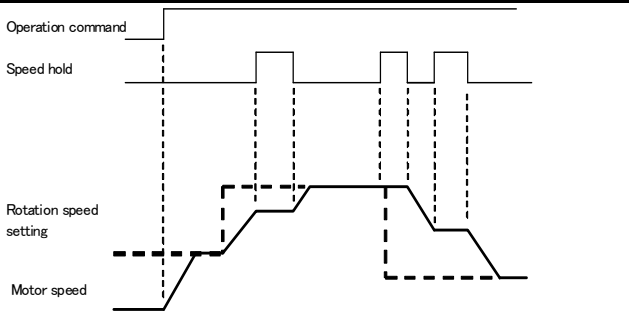
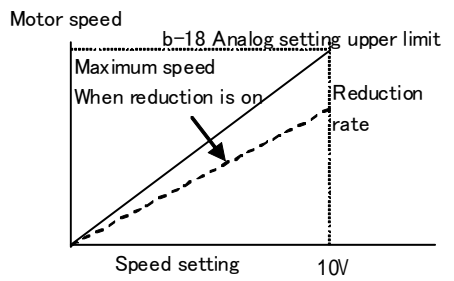
Install a switch between the Multi-function terminals (1) – (5) (Terminals [MI1] - [MI5]) and [PS] terminal to turn ON/OFF.

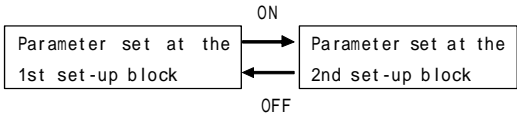
<Use of [CN-S1] jumper socket with internal power source>

Install a switch between the Multi-function terminals (1) – (5) (Terminals [MI1] - [MI5]) and [GND1] terminal to turn ON/OFF.

Detail of multi-function input setting

No.	Items	Description																																				
0 to 2	Preset speed	<p>By selecting one of three input of the preset speed selection 1 - 3, you can utilize the setting of the preset speed command 1 - 7 (d-15 - d-21).</p> <table><tr><th>Preset speed 3</th><th>Preset speed 2</th><th>Preset speed 1</th><th>Speed command</th></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>Standard selection (no preset)</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>d-15 (preset speed command 1)</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>d-16 (preset speed command 2)</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>d-17 (preset speed command 3)</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>d-18 (preset speed command 4)</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>d-19 (preset speed command 5)</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>d-20 (preset speed command 6)</td></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>d-21 (preset speed command 7)</td></tr></table>	Preset speed 3	Preset speed 2	Preset speed 1	Speed command	OFF	OFF	OFF	Standard selection (no preset)	OFF	OFF	ON	d-15 (preset speed command 1)	OFF	ON	OFF	d-16 (preset speed command 2)	OFF	ON	ON	d-17 (preset speed command 3)	ON	OFF	OFF	d-18 (preset speed command 4)	ON	OFF	ON	d-19 (preset speed command 5)	ON	ON	OFF	d-20 (preset speed command 6)	ON	ON	ON	d-21 (preset speed command 7)
Preset speed 3	Preset speed 2	Preset speed 1	Speed command																																			
OFF	OFF	OFF	Standard selection (no preset)																																			
OFF	OFF	ON	d-15 (preset speed command 1)																																			
OFF	ON	OFF	d-16 (preset speed command 2)																																			
OFF	ON	ON	d-17 (preset speed command 3)																																			
ON	OFF	OFF	d-18 (preset speed command 4)																																			
ON	OFF	ON	d-19 (preset speed command 5)																																			
ON	ON	OFF	d-20 (preset speed command 6)																																			
ON	ON	ON	d-21 (preset speed command 7)																																			

No.	Items	Description															
3 and 4	Acceleration / deceleration time selection	<p>Acceleration/deceleration time can be changed during operation by using the input of the Acceleration/deceleration time selection 1 - 2.</p> <p>(When S-pattern acceleration/deceleration is used, the S-pattern acceleration/deceleration usage selection (d-06) is needed to be turned ON.)</p> <table border="1"> <thead> <tr> <th>Accel./decel. time select 2</th><th>Accel./decel. time select 1</th><th>Acceleration/deceleration time to be selected. (Includes S-pattern accel./decel.)</th></tr> </thead> <tbody> <tr> <td>OFF</td><td>OFF</td><td>Standard (Accel./Decel. time selected in d-00)</td></tr> <tr> <td>OFF</td><td>ON</td><td>Accel./Decel. time (2) (5.Acc2, 6.dEc2 and d-11 to 14)</td></tr> <tr> <td>ON</td><td>OFF</td><td>Accel./Decel. time (3) (d-02, d-03 (w/o S-pattern))</td></tr> <tr> <td>ON</td><td>ON</td><td>Accel./Decel. time (4) (d-04, d-05 (w/o S-pattern))</td></tr> </tbody> </table>	Accel./decel. time select 2	Accel./decel. time select 1	Acceleration/deceleration time to be selected. (Includes S-pattern accel./decel.)	OFF	OFF	Standard (Accel./Decel. time selected in d-00)	OFF	ON	Accel./Decel. time (2) (5.Acc2, 6.dEc2 and d-11 to 14)	ON	OFF	Accel./Decel. time (3) (d-02, d-03 (w/o S-pattern))	ON	ON	Accel./Decel. time (4) (d-04, d-05 (w/o S-pattern))
Accel./decel. time select 2	Accel./decel. time select 1	Acceleration/deceleration time to be selected. (Includes S-pattern accel./decel.)															
OFF	OFF	Standard (Accel./Decel. time selected in d-00)															
OFF	ON	Accel./Decel. time (2) (5.Acc2, 6.dEc2 and d-11 to 14)															
ON	OFF	Accel./Decel. time (3) (d-02, d-03 (w/o S-pattern))															
ON	ON	Accel./Decel. time (4) (d-04, d-05 (w/o S-pattern))															
5 and 6	Speed UP/DOWN command (MRH mode)	<p>By turning the MRH function usage selection (d-27) ON and selecting terminal block for the speed commanding place, acceleration/deceleration by UP/DOWN command becomes possible. If speed exceeds its upper or lower limit, it will be automatically accelerated/decelerated to the upper or lower limit without having UP/DOWN command. Rotation can be reversed by setting negative value into the lower limit speed.</p> 															
7	Speed hold	<p>When this signal is turned on during acceleration/deceleration operation of the inverter, the inverter temporarily stops acceleration/deceleration and hold the speed at that time. When the signal is turned off, the inverter resumes acceleration/deceleration. (Note: speed hold is ineffective during deceleration stop by the stop command)</p> 															
8	S-pattern accel./decel. prohibition	<p>S-pattern accel./decel. can be forcibly prohibited to obtain normal accel./decel. by turning on this signal even when S-pattern accel./decel. usage selection is turned on and during the S-pattern accel./decel. operation.</p>															
9	Maximum speed reduction	<p>If terminal block is selected as the speed command input place, the speed command will be reduced in accordance with the setting of the Maximum speed reduction rate (H-12) by turning on this signal (see figure on the right).</p> <p>This signal can be turned ON/OFF when the motor is stopped. If this signal is turned ON/OFF when the motor is in operation, switching will not occurred until the motor is stopped once.</p> <p>(This function is only effective for the analog input from the terminal block)</p> 															
10	Droop control disabled	<p>Even when the Droop control usage selection (i-02) is turned ON, droop control will be disabled by turning on this signal. For more information about droop control, please refer to Chapter3 3.10 <i-area> also Chapter4 4.10 <i-area>.</p>															
11	Speed/torque control selection	<p>If the Operation mode selection (i-07) is set to 4 (Speed/torque control contact switch), switching between speed control and torque control can be made by this signal. It will be speed control at tuning OFF and torque control at tuning ON. For more information, please refer to Chapter3 3.10 <i-area> also Chapter4 4.10 <i-area>.</p>															

No.	Items	Description
12	Forward/reverse operation command	When the Operation commanding place selection (b-11) is set to 1 (terminal block) or the JOG commanding place selection (b-12) is set to 1 (terminal block), the Operation command/Jog command can be switched between forward and reverse by turning ON this signal. (forward reverse or reverse forward) * Because of the Operation commanding place selection (b-11) is set to 1, please install a switch between[ST-F] terminal and [PS] terminal of the VFC66-Z terminal block in order to turn ON/OFF the operation signal. For more information, please refer to the manual <Basic operation>.
13	DC brake command	Turning ON of this signal activates DC brake which allows DC current to flow into the motor. The current can be adjusted by the DC brake gain (b-04) in the vector mode. After this signal is turned OFF, the motor will be stopped after the duration set in the DC brake operation time (b-03). If this signal and Operation/Jog command are input simultaneously, then Operation/Jog command will be prioritized.
14	Initial excitation command	Turning ON of this signal activates the initial excitation operation which allows an exciting current to flow into the motor. It can be used when pre-excitation is needed for quick response at the start. There are two modes in initial excitation operation; AC initial excitation and DC initial excitation. They can be selected by the Initial excitation selection (i-18).
15 to 18	External failure signal (protection relay 86A enabled)	Having a failure signal of peripheral equipment as an input of this signal, the inverter can be stopped for protection. When the external failure signal 1 – 4 is turned ON, then inverter cuts its output and turns ON the protection relay 86A. Simultaneously, [EF1] – [EF4] will appear on the console. Moreover, the trace back will be triggered by this signal. To cancel the protective operation, execute protective operation reset by pressing [STOP/RESET] key or by setting any of the multi-function input terminal to “protection reset” and then turn it ON.
19 to 22	External failure signal (protection relay 86A disabled)	Same as above except the protection relay 86A will be ineffective. Also trace back will not be triggered by this signal. In this case, if all of the Operation/Jog/DC brake commands of the inverter are turned OFF, then protective operation will be released automatically.
23	Trace back external trigger	Normally, trace back is triggered when failure is occurred or when protective operation is activated, however, by inputting this signal, trace back can be triggered forcibly. For more information about trace back, please refer to Chapter3 3.7 <F-area> also Chapter4 4.7 <F-area>.
24	2nd set-up block selection	When this signal is ON, each parameter set in the 2nd set-up block will be used. 
25	Emergency stop (B contact)	Emergency stop signal on the B contact input makes the contact open and brings an emergency stop. (Therefore, care must be taken if this function is set into any of the terminal block, it makes emergency stop and cannot be operated unless otherwise close the contact.)
27	Speed commanding terminal block selection	Turning ON of this signal forcibly selects the terminal block (VFC66-Z[A1N1] terminal) as the speed command input place regardless of the setting of the Speed commanding place selection (b-10). If this signal and Preset speed selection are input simultaneously, then this signal will be prioritized. * If I066-Z option or digital communication option is installed, it will be forcibly changed from the VFC66-Z [A1N1] terminal to the terminal block [A1N2] terminal for the I066-Z option or the digital communication option regardless of the setting of the Digital communication option selection (J-00). Note: When the Digital communication option selection (J-00) is set to 0 (OFF), protective function of the I066-Z option or the digital communication option will not be activated.
29	Operation command [reverse] (STARTR)	With the setting of the Operation commanding place selection (b-11) = 1 (terminal block), the motor will be reversed when this signal is ON.
30	Jog command [forward] (JOGF)	With the setting of the JOG commanding place selection (b-12) = 1 (terminal block), it becomes Jog operation [forward] when this signal is ON.
31	Jog command [reverse] (JOGR)	With the setting of the JOG commanding place selection (b-12) = 1 (terminal block), it becomes Jog operation [reverse] when this signal is ON.

No.	Items	Description
32	Emergency stop (A contact)	Emergency stop signal on the A contact input makes the contact open and brings an emergency stop.
33	Protection reset (RESET)	Turning ON of this signal cancels the protective operation.
34 to 37	External signal input	According to using this function, VFC can transmit the signal from peripheral devices to another unit(master unit) through the optional digital communication board. (It is possible to use this function as a coil input of PLC.)

4.5. d-area (Acceleration/deceleration time, speed jump function, MRH function selection area)

Selection and setting of acceleration/deceleration time

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
d-00	Acceleration/Deceleration time selection	0: Acceleration/deceleration Time (1) 1: Acceleration/deceleration Time (2)		0	
d-01	JOG acceleration/deceleration time selection	2: Acceleration/deceleration Time (3) 3: Acceleration/deceleration Time (4)		1	
d-02	Acceleration time(3)	0.0 to 3600.0	0.1	30.0	sec
d-03	Deceleration time(3)	0.0 to 3600.0	0.1	30.0	sec
d-04	Acceleration time(4)	0.0 to 3600.0	0.1	30.0	sec
d-05	Deceleration time(4)	0.0 to 3600.0	0.1	30.0	sec
d-06	S-pattern acceleration/deceleration usage selection	OFF (not use) ON (use)		OFF	
d-07	S-pattern rise time(1)	0.0 to 60.0	0.1	0.1	sec
d-08	S-pattern acceleration reach time(1)	0.0 to 60.0	0.1	0.1	sec
d-09	S-pattern fall time(1)	0.0 to 60.0	0.1	0.1	sec
d-10	S-pattern deceleration reach time(1)	0.0 to 60.0	0.1	0.1	sec
d-11	S-pattern rise time(2)	0.0 to 60.0	0.1	0.1	sec
d-12	S-pattern acceleration reach time(2)	0.0 to 60.0	0.1	0.1	sec
d-13	S-pattern fall time(2)	0.0 to 60.0	0.1	0.1	sec
d-14	S-pattern deceleration reach time(2)	0.0 to 60.0	0.1	0.1	sec

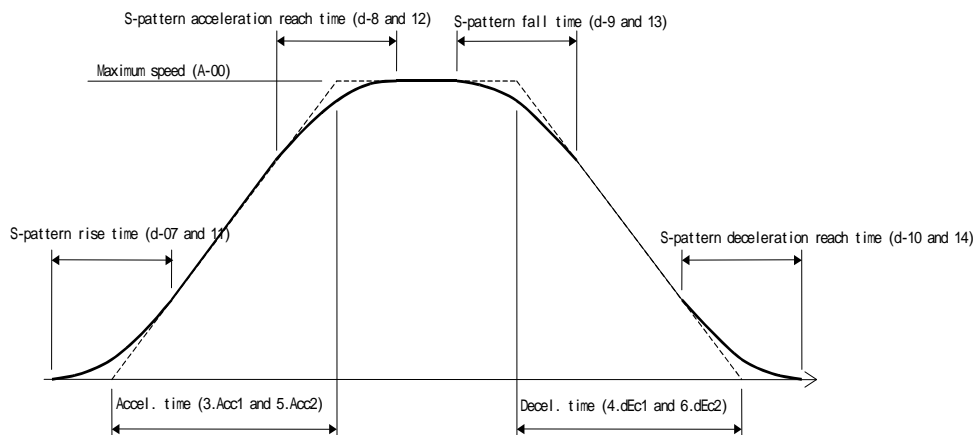
Select an acceleration/deceleration time setting to be used in normal operation and Jog operation by the Acceleration/Deceleration time selection (d-00) and JOG acceleration/deceleration time selection (d-01) respectively. Please note that the acceleration/deceleration time setting for normal operation can be changed also from the multi-function input.

Setting of d-00 or d-01, or selection from multi-function input	Acceleration time	Deceleration time	S-pattern rise time	S-pattern accel. reach time	S-pattern fall time	S-pattern decel. reach time
0:Accel/Decel time (1)	3.Acc1	4.dEc1	d-07	d-08	d-09	d-10
1:Accel/Decel time (2)	5.Acc2	6.dEc2	d-11	d-12	d-13	d-14
2:Accel/Decel time (3)	d-02	d-03	0.0	0.0	0.0	0.0
3:Accel/Decel time (4)	d-04	d-05	0.0	0.0	0.0	0.0

• Acceleration time(1) (3.Acc1), Deceleration time(2) (4.dEc1), Acceleration time(2) (5.Acc2) and Deceleration

time(2) are items of the basic set-up area.

- When acceleration/deceleration time (3) or (4) is selected, all of the S-pattern acceleration/deceleration time will be 0.0. Acceleration/deceleration time is acceleration/deceleration time between 0 speed and the maximum speed of the setting and the time for S-pattern curve as shown in the figure below. To use S-pattern acceleration/deceleration function, it is necessary to turn ON the S-pattern acceleration/deceleration usage selection (d-06). When the selection (d-06) is OFF, S-pattern acceleration/deceleration cannot be obtained even if time setting for the S-pattern acceleration/deceleration is set.



Time chart of acceleration/deceleration (S-pattern accel./decel.)

Preset operation speed command setting

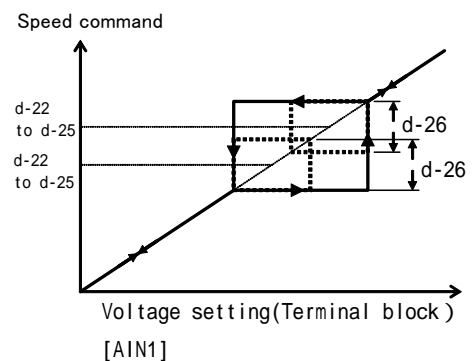
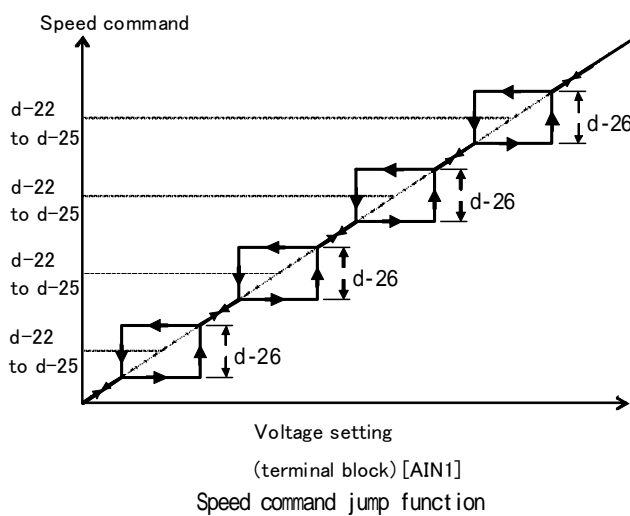
Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
d-15	Preset speed(1)	-Maximum speed (A-00) to Maximum speed (A-00)	1	0	r/min
d-16	Preset speed(2)		1	0	r/min
d-17	Preset speed(3)		1	0	r/min
d-18	Preset speed(4)		1	0	r/min
d-19	Preset speed(5)		1	0	r/min
d-20	Preset speed(6)		1	0	r/min
d-21	Preset speed(7)		1	0	r/min

This is the speed command setting of the preset operation function selected by the multi-function input signal. For more information on the preset operation selection by the multi-function input signal, please refer to Chapter3 3.4 <c-area (multi-function input related area)> and Chapter4 4.4 <c-area (multi-function input related area)>.

Speed command jump function setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
d-22	Jump speed(1)	0 to Maximum speed (A-00)	1	0	r/min
d-23	Jump speed(2)		1	0	r/min
d-24	Jump speed(3)		1	0	r/min
d-25	Jump speed(4)		1	0	r/min
d-26	Jump speed width	0 to 300	1	0	r/min

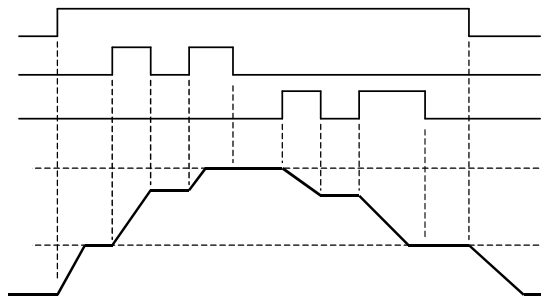
This function makes the speed command to jump to avoid resonance point speed of the equipment. At the jump point, speed command jumps as hysteresis S-pattern as shown in the figure below. It is necessary to make the speed command for acceleration/deceleration control to jump, so that during acceleration/deceleration, jump width can be passed by the gradient obtained from the setting of acceleration/deceleration time setting.



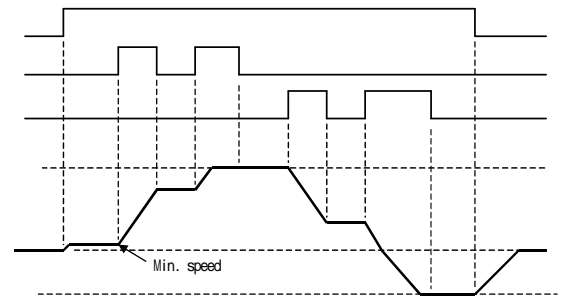
MRH (acceleration/deceleration by a contact) mode setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
d-27	MRH function usage selection	OFF (not use) ON (use)		OFF	
d-28	MRH upper limit speed	MRH lower limit speed (d-29) to Maximum speed (A-00)	1	300	r/min
d-29	MRH lower limit speed	-Max. speed to MRH upper limit speed (d-28)	1	0	r/min

By turning the MRH function usage selection (d-27) ON, acceleration/deceleration control can be made from the contact (MRH mode). When d-27 is turned ON, UP/DOWN of speed can be made from the multi-function input contact if the terminal block is selected as the operation command input place by the setting of the Commanding place when coupled (b-09) or the Speed commanding place selection (b-10). For more information, please refer to Chapter3 3.4 <c-area (multi-function input related area)> also Chapter4 4.4 <c-area (multi-function input related area)>. Speed is accelerated toward the MRH upper limit speed by the UP command and decelerated toward the MRH lower limit speed by the DOWN command. If no command is input, or if both commands are input same time, then it keeps the speed at that time. In case if the speed is not in the range between settings of the MRH upper limit speed (d-28) and the MRH lower limit speed (d-29), then it will be automatically accelerated or decelerated to the setting of the MRH upper limit speed (d-28) or MRH lower limit speed (d-29) respectively. Rotation can be reversed by setting negative value into the MRH lower limit speed (d-29).



Start



When setting of MRH lower limit speed is positive

When setting of MRH lower limit speed is negative

Note: If the signal of the multi-function input preset speed selection or the speed command terminal block selection is input during the MRH mode, the speed command of these signals are prioritized. For more information, please refer to Chapter3 3.4 <c-area (multi-function input related area)> also Chapter4 4.4 <c-area (multi-function input related area)>.

Speed deviation limiting control function setting during acceleration/deceleration

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
d-30	Speed deviation limiting command selection	OFF (without limiting command) ON (with limiting command)		OFF	
d-31	Maximum deviation (positive)	0.0 to 100.0	0.1	5.0	%
d-32	Maximum deviation (negative)	-100.0 to 0.0	0.1	-5.0	%

When the Speed deviation limiting command selection is turned ON, motor speed and output of the acceleration/deceleration control will be limited to the deviation of the positive direction deviation maximum value (d-31) and the negative direction deviation maximum value (d-32). This function prevents rapid acceleration due to sudden change in load or voltage in such the case when load is suddenly reduced in the condition of speed loss due to torque limit during the operation, and recovers the speed with the gradient of the acceleration/deceleration time setting. (Please note that if the deviation is set too small, it limits acceleration/deceleration.)

4.6. E-area (Torque limit, torque command characteristics, vector control related setting area)

Regeneration stall prevention function setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
E-00	Regeneration stall prevention function usage selection	OFF (not use) ON (use)		OFF	
E-01	Regeneration stall prevention voltage	(200V class) 320 to 360 (400V class) 640 to 720	1	340 680	V

In case if DC voltage rise exceeds the regeneration stall prevention voltage, the torque command on regeneration side (negative direction when forward rotation and positive direction when reverse rotation) is limited to 0 and during deceleration, deceleration is ceased once to prevent being trip by overvoltage protection operation (OV). When optional DB (dynamic brake) unit is used for this function, please set the regeneration stall prevention voltage of the function setting and the DB operation level of the unit same level.

High-efficiency operation mode setting

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
E-02	High-efficient mode usage selection	OFF (not use) ON (use)		OFF	

When load is light, the VF66B adjusts the exciting current command automatically and performs high efficiency operation. (Note: Responsiveness is impaired in this mode. Please turn OFF this mode if high speed response is required.)

Rotation direction change setting of the motor

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
E-03	Forward direction change	OFF (Forward) ON (Reverse)		OFF	

When the Forward direction change (E-03) is ON, the direction of the motor can be reversed without replacing the wirings of U/V/W phases.

If the Reverse prohibition mode selection (b-08) is set to 2 <Reverse prohibition> when the Forward direction change (E-03) is ON, it prohibits forward direction rotation.

Simulation mode setting

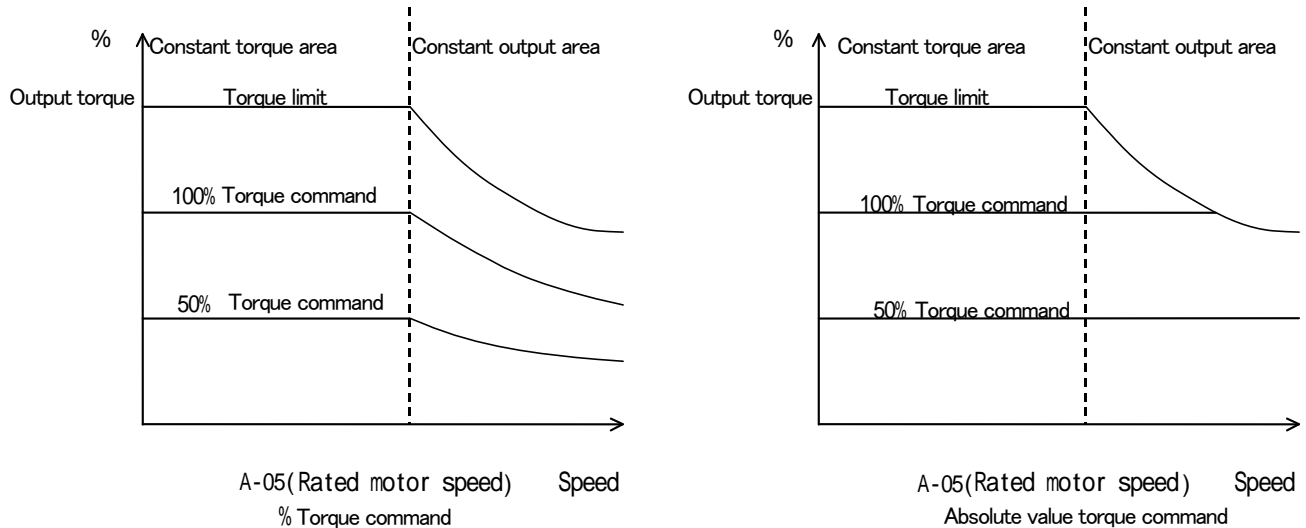
Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
E-04	Simulation mode	OFF (without simulated operation) ON (with simulated operation)		OFF	

When the Simulation mode (E-04) is ON, the inverter mode can be changed to the simulation mode. Simulation mode means that VF66B behaves to be virtually in operation mode without actually outputting voltage. In the simulation mode, inverter will not output any voltage from its operation, so that it is possible to carry out sequence check without running the motor connected to the VF66B.

Torque command mode selection

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
E-05	Torque command mode selection	0: % command 1: Absolute value command		0	

Select the characteristics of the torque command in the constant output area.



Even when the torque command is constant, output torque will be reduced inversely proportional to the speed in order to keep the output in constant in the constant output area.

Even in the constant output area, output torque is constant if command is constant. (Note: Torque limiter will be reduced so that constant output can be obtained.)

Current control gain adjustment

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
E-07	Current control proportion gain	40.0 to 200.0	0.1	100.0	%
E-08	Current control integral gain(1)	20.0 to 500.0	0.1	100.0	%
E-09	Current control integral gain(2)	20.0 to 500.0	0.1	100.0	%

This is gain for current control. Under normal conditions, please stay on the default value.

Motor temperature detecting option usage selection

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
E-10	Motor temperature compensation	OFF (without compensation) ON (with compensation)		OFF	

Turn ON when compensation of temperature variance is carried on by the motor temperature detected from the temperature sensor embedded in the motor. In the VF66B, calculation of motor temperature compensation is included in the inverter control calculation, however, motor temperature before the operation cannot be calculated so that temperature detecting option is used in order to compensate torque at the start.

Note: TVPT66-Z option or TVTH66-Z option as well as a motor temperature sensor are required for this function.

Flux command adjustment

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
E-11	Flux-command	20.0 to 150.0	0.1	100.0	%
E-06	Flux reinforcing rate at start	100.0 to 150.0	0.1	100.0	%

Flux-command (E-11): Command value of flux strength used for vector control. Under normal conditions please set it to 100.0%.

Flux reinforcing rate at start (E-06): Strengthen flux only at start to increase starting torque. In some case it brings instability depending on motor so that under normal conditions, please set it to 100.0%.

Motor cooling fan selection (in case of speed sensor-less operation)

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
E-12	Motor cooling fan(sensor-less drive)	0: Self cooling fan 1: Forced air cooling fan		0	

In case if motor cooling fan is driven by separate motor, select 1 (Forced air cooling fan), and if the fan is directly connected to the motor shaft and driven by the motor itself, select 0 (Self cooling fan).

4.7. F-area (Built-in DB (dynamic brake) operation, protection function, trace back setting area)

Built-in DB (dynamic brake) operation level setting

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
F-00	Built-in DB(DynamicBrake) operation level	(200V class) 320.0 to 360.0	0.1	340.0	V
		(400V class) 640.0 to 720.0	0.1	680.0	V

Both VF66B-2R222 – 2222 (200V class) and VF66B-2R244 – 2244 (400V class) have a built-in transistor for DB (dynamic brake) and dynamic braking is available if a DB resistor and a thermal relay are inserted between [+2] and [B] on the main circuit terminal block. The operation level of this built-in DB transistor is set by the Built-in DB operation level (F-00). Built-in DB transistor will be turned ON when DC voltage is higher than this setting and turned OFF when the DC voltage is lower than this setting. Under normal conditions this setting should stay on the default setting, however, in case if the power voltage is high and makes it turn ON even when not in the brake mode, then set higher value.

Note: If this function is used with the regeneration converter VF61R or VF64R, please select 360V (200V class) or 720V (400V class) for this setting.

Overspeed protection setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
F-01	Forward overspeed setting	0.0 to 150.0	0.1	105.0	%
F-02	Reverse overspeed setting	-150.0 to 0.0	0.1	-105.0	%

Overspeed protection will be activated and the inverter will be tripped when the motor speed exceed Forward overspeed setting (F-01) or Reverse overspeed setting (F-02) with respect to the maximum motor speed. Overspeed protection can be set in forward direction and reverse direction separately.

Note: When the Maximum speed (A-00) is changed, please readjust this setting.

**CAUTION** [Overspeed protection setting]

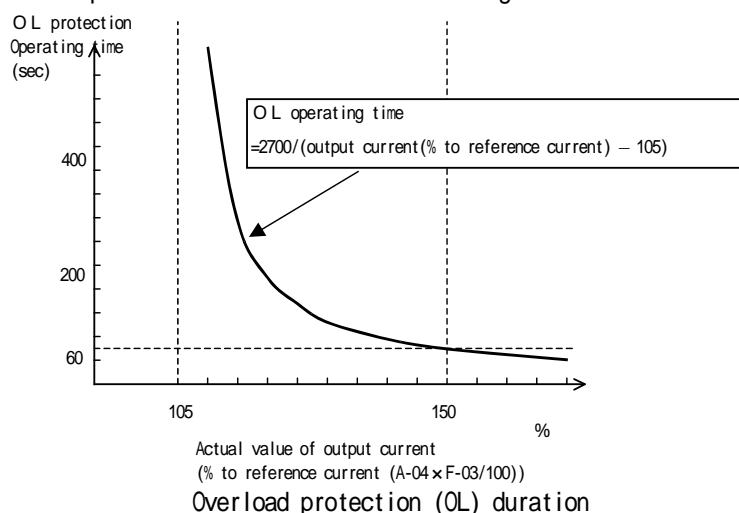
- Please do not set the value considerably larger than the rated speed of the motor to the Forward overspeed setting (F-01) or Reverse overspeed setting (F-02). There is possibility of cause serious accident.

Overload protection setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
F-03	Overload protection setting	20 to 110	1	100	%

Set the reference current value for the overload protection in the rate against the Rated motor current (A-04).

Overload protection counter will be initiated when the effective value of the inverter output current exceeds 105% of the reference current and the overload protection (OL) will be activated in the 60 seconds curve when the output current is 150% as shown in figure below.



Note: Overload counter can be monitored from the console. (It is compared with the overtorque counter and whichever has a greater value will be displayed.)

Overload counter starts count when it is in an overload condition with time and overload protection will be activated and inverter will be tripped when it becomes 100%.

OL pre-alarm function can be used so that signal is output when the count on the overload counter exceeds given point. For more information, refer to Chapter3 3.9 <H-area (multi-function output setting area)> also Chapter4 4.9 <H-area (multi-function output setting area)>.

Cumulative operation timer setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
F-04	Cumulative operation timer(1-Capacitor)	0 to 65535	1	Note 1	Hr
F-05	Cumulative operation timer(2-Fan)	0 to 65535	1	Note 1	Hr

Note 1: See also table below.

Factory default data for F-04 and F-05

Inverter type	Default data F-04	Default data F-05	Inverter type	Default data F-04	Default data F-05
2R222	43800	21900	2R244	43800	21900
3R722			3R744		
5R522			5R544		
7R522			7R544		
1122			1144		
1522			1544		
2222			2244		
3022			3044		
3722			3744		
4522			4544		
5522			5544		
7522			7544		
9022			11044		
15022			16044		
18022			20044		
			25044		
			31544		
			40044		
			50044		
			60044		
			75044		
			100044		

In VF66B, cumulative operation time is counted in 1-hour unit. When the cumulative time exceeds the setting value of the Cumulative operation timer(1-Capacitor) (F-04) or Cumulative operation timer(2-Fan) (F-05), then the LED <ALM> of the SET66-Z or SET66EX-Z will be lit. This function can be used as a guide of maintenance timing for the VF66B.

If the cumulative operation timer setting is not changed from the factory default value, the Cumulative operation timer(1-Capacitor) (F-04) and Cumulative operation timer(2-Fan) (F-05) will indicate rough estimation of capacitor life and cooling fan life respectively.

When timer remaining time 1 of the monitor display item becomes 0 or less, it is indicating the time for capacitor replacement and recommends the replacement.

Similarly, when timer remaining time 2 becomes 0 or less, it is indicating the time for cooling fan replacement.

Note: For more information about monitor items and cooling fan replacement, please refer to instruction manual (trouble shooting/maintenance).

Motor overheating protection

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
F-06	Motor overheat protection operation selection	OFF (without protection operation) ON (with protection operation)		OFF	

Select ON/OFF of the motor overheat protection. When this function is ON, the inverter will be tripped when the motor temperature exceeds 150 degrees in Celsius.

Note: TVPT66-Z option or TVTH66-Z option as well as a motor temperature sensor are required for this function.

Operation setting of the protection relay (86A) in case of power failure

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
F-07	Protection relay (86A) operation selection upon power failure	OFF (without protection operation) ON (with protection operation)		OFF	

Select the operation of the protection relay (86A) in case of the detection of power failure by the inverter.

OFF: Protection relay will not be activated even if power failure is detected and power failure can be reset by only turning OFF the Operation command after power recovery (or Jog command or DC brake command). In addition, when the Instantaneous power interruption restart (b-07) is ON, it will be reset automatically after the recovery of power and resumes operation.

ON: Protection relay will be activated and inverter will be tripped in case of the detection of power failure. In this case, like other protection operation, protection resetting by the reset terminal or [STOP/RESET] key is required. Moreover, even if the Instantaneous power interruption restart (b-07) is turned ON, it will not resume operation automatically.

Protection retry function setting

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
F-08	Protection retry count setting	0 to 5	1	0	Count

When the protection operation activates or occurs, repeat [Automatic protection reset] [Automatic operation resuming] up to the count set at the Protection retry count setting (F-08). Automatic reset will take place 1 second after the occurrence of a protection operation, then operation will resume automatically. If another protection operation is occurred within 10 seconds after resuming of operation, add +1 to the retry counter and reset again to resume the operation if retry count on the retry counter is equal or less than the value set in the Protection retry count setting (F-08). Retry counter will be cleared and it will be assumed that the retry is succeeded if another protection operation is not occurred within 10 seconds after the resuming of operation by the automatic operation resuming.

Note: The protective operations which can be retried are limited to following protections: overvoltage, overspeed, over frequency, power failure (when 86A is ON), option error and external failure (operation of protection relay 86A). For other protections, retry is not available for safety reasons.

External failure detection delay time setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
F-09	External failure(1) detection delay time	0.0 to 30.0	0.1	0.0	sec
F-10	External failure(2) detection delay time	0.0 to 30.0	0.1	0.0	sec
F-11	External failure(3) detection delay time	0.0 to 30.0	0.1	0.0	sec
F-12	External failure(4) detection delay time	0.0 to 30.0	0.1	0.0	sec

Time for detecting external failure signals can be delayed in accordance with the values set in the External failure (1)-(4)detection delay time setting (F-09 – F-12). This function can be used for adjusting detecting sensitivity of the external failure signals.

Trace back function setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
F-13	Traceback pitch	0 to 100	1	1	msec
F-14	Traceback trigger point	1 to 99	1	80	
F-15	Traceback CH1 selection	0 to 12	1	0	
F-16	Traceback CH2 selection	0 to 12	1	0	
F-17	Traceback CH3 selection	0 to 12	1	0	
F-18	Traceback CH4 selection	0 to 12	1	0	
F-19	Traceback CH5 selection	0 to 12	1	0	
F-20	Traceback CH6 selection	0 to 12	1	0	
F-21	Traceback CH7 selection	0 to 12	1	0	
F-22	Traceback CH8 selection	0 to 12	1	0	
F-23	Traceback CH9 selection	0 to 12	1	0	
F-24	Traceback CH10 selection	0 to 12	1	0	
F-25	Traceback CH11 selection	0 to 12	1	0	
F-26	Traceback CH12 selection	0 to 12	1	0	

VF66B has a trace back function which stores the control data such as current data and voltage data at the time of the protection occurred and allows prompt recovery by retrieving and analyzing stored data. The data stored by the trace back function are the data set by default value, current and voltage, in addition, it is possible to specify the output of each built-in PLC when PLCH function is used.

- **Traceback pitch (F-13)**

Set the pitch of trace back.

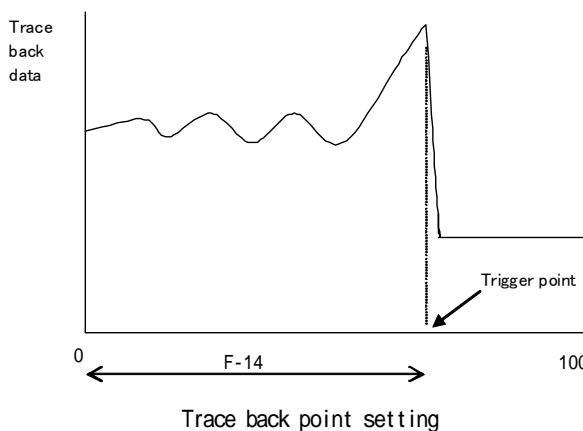
- **Traceback trigger point (F-14)**

Set the trigger point of trace back.

- **Traceback CH1 - 12 selection (F-15 to 26)**

Select each channel of trace back either as an internal data of the inverter or as a parameter of the built-in PLC function.

Note: Settings of trace back pitch and trace back point are needed to be set prior to the collection of the trace back data by the protection operation.



F-15 – 26 setting		0	1 to 12	
	Recording data	Dimension	Recording data	Dimension
ch 1	U-phase current	(3536/rated current of inverter)	Output RAM (1 - 12) of PLC (Setting of F-15 to 26 directly reflects selection of output RAM)	20000/100%
ch 2	V-phase current			
ch 3	W-phase current			
ch 4	DC voltage	10/1V (200V class)		
ch 5	Output voltage	5/1V (400V class)		
ch 6	Motor speed	20000/Max. speed		
ch 7	Speed command (accel/decel Control command)			
ch 8	Torque command	5000/100%		
ch 9	Output frequency	20000/frequency equivalent to Max. speed		
ch 10	Slip frequency			
ch 11	Flux	1024/rated flux		
ch 12	Motor temperature	10/1		

Note: By using PC Tool software (sold separately), it is possible to retrieve the trace data from the PC. For more information, please refer to separate <VF66 series PC Tool user manual>.

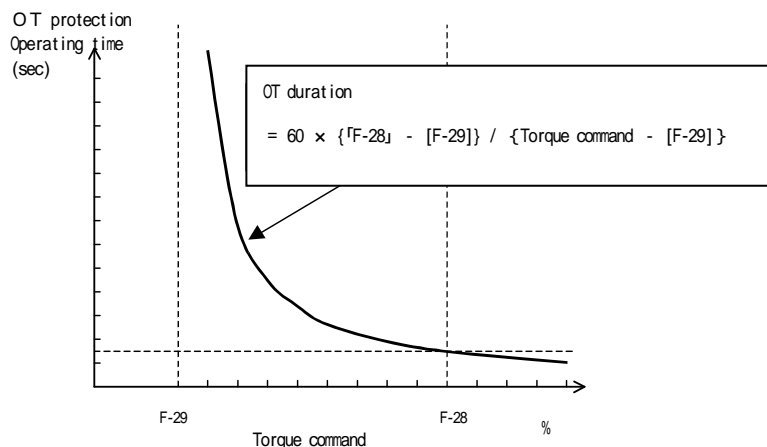
Overtorque protection setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
F-27	Overtorque protection function selection	OFF (without over torque protection) ON (with over torque protection)		ON	
F-28	Overtorque protect level setting	110 to 205	1	150	%
F-29	Overtorque protection operation standard torque	50 to 105	1	105	%

Set the overtorque protection. ON/OFF of the protective operation can be selected by the Overtorque protection function selection (F-27).

In case that the Overtorque protection function selection is ON, when the torque command exceeds the reference torque set in the Overtorque protection operation standard torque (F-29), it assumes overtorque condition and initiates over torque protection counter. As shown in the figure below, when the torque command reaches setting level of the Overtorque protect level setting (F-28), the overtorque protection (OT) will be activated at 60 second point on the curve.

The torque command used in this protection can be a compensated value in which mechanical loss component is deducted from actual torque command. For more information, please refer to Chapter3 3.10 i-area < Droop control, mechanical loss compensation setting area> as well as Chapter4 4.10 i-area < Droop control, mechanical loss compensation setting area>.



Overtorque protection (OT) duration

Note: Like the overload protection, overtorque counter can be monitored from the console. (It is compared with the overload counter and whichever has a greater value will be displayed.)

Overtorque counter starts count when it is in an overtorque condition with time and overtorque protection will be activated and inverter will be tripped when it becomes 100%.

OL pre-alarm function which signal is output when the count on the overtorque counter exceeds given point can be used. For more information, refer to Chapter3 3.9 <H-area (multi-function output setting area)> also Chapter4 4.9 <H-area (multi-function output setting area)>.

Speed control error protection setting

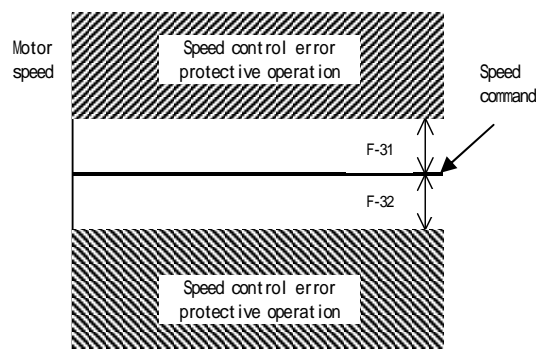
Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
F-30	Speed control error function usage selection	OFF (without speed control error function) ON (with speed control error function)		OFF	
F-31	Speed control error detection speed width (positive)	2.0 to 30.0	0.1	5.0	%
F-32	Speed control error detection speed width (negative)	-30.0 to -2.0	0.1	-5.0	%

ON/OFF of the speed control error protection can be selected by the Speed control error function usage selection (F-30).

When the speed control error operation is selected, and if the motor speed relative to the speed command (0.SrEF) exceeds the range between 0.SrEF + [F-32] and 0.SrEF + [F-31] (where F-32 is negative value), it becomes speed control error and the inverter will be tripped.

This function will be activated when speed is lowered due to exceeding of load torque over the torque limit in such the case of abnormality in speed control area or PG.

The speed command to be used as a reference is the speed command which has been selected if the Speed control (i-7 = 0) is selected, in other case, input from the terminal block VFC66-Z (voltage input of 0 to ±10V or 0 to +10V) or the terminal block [4-20] (current input 4 to 20mA) will be a speed command.



Operating range of the speed control error protection function

4.8. G-area (Analog input/output setting area)

Temperature detection selection

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-00	Temperature detection selection	0: not use 1: thermistor (TVTH66-Z, optional) 2: pt100 [thermocouple](TVPT66-Z, optional)		0	

Select the motor temperature detector installed in the motor.

0: No temperature detection

1: Use TVTH66-Z option

2: Use TVPT66-Z option

For more information, please refer to user manual of the option.

Motor temperature detection adjustment (when TVTH66-Z option or TVPT66-Z option is used)

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-01	Temperature detection offset adjustment	-20.0 to 20.0	0.1	0.0	%
G-02	Temperature detection gain adjustment	50.0 to 150.0	0.1	100.0	%

Adjust the offset and gain of the temperature detected by the motor temperature compensation option TVTH66-Z or TVPT66-Z. For more information, please refer to user manual of the option.

Analog input (2) characteristic selection (when I066-Z option or digital communication option is used)

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-03	Analog input(2) characteristics selection	0:0 to $\pm 10V$ 1:0 to 10V 2:4 to 20mA		1	

Select the input characteristics of the analog input (2) terminal AIN2 for the I066-Z option or the digital communication option.

When the Analog input (2) characteristic selection is set to 2, SW operation of the I066-Z option or the digital communication option is required. For more information, please refer to user manual of the option.

Analog input (2) limit setting (when I066-Z option or digital communication option is used)

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-04	Analog input(2) upper limit speed	Absolute value of Analog input(2) lower limit speed (G-05) to 100.0	0.1	100.0	%
G-05	Analog input (2) lower limit speed	-Analog input(2) upper limit speed (G-04) to Analog input(2) upper limit speed (G-04)	0.1	0.0	%

Set the upper and lower limits of the speed in % relative to the maximum speed when analog input set in the Analog input(2) characteristics selection (G-03) is input in the analog input terminal AIN2 as a speed command. In the forward rotation, even if the speed command greater than the speed set in the Analog input(2) upper limit speed (G-04) is input to the AIN2, the rotation speed of the motor will be regulated to the setting of the G-04. In the reverse rotation, motor speed will be regulated so that it will not exceed the value set in the Analog input(2) lower limit speed (G-05). For more information, please refer to user manual of the option.

Analog input (3) characteristic selection (when I066-Z option is used)

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-06	Analog input(3) characteristics selection	0: 0 to ± 10 V 1: 0 to 10V 2: not use 3: Pulse train (0[Hz] to 150[kHz])		1	

Select the input characteristic of the analog input terminal AIN3 of the I066-Z option. For more information, please refer to user manual of the option.

For more information about the voltage characteristic (0 to ± 10 [V] and 0 to 10[V]) and the current characteristic (4 to 20[mA]) of analog input, please refer to Chapter4 4.3 b-area <Analog speed command characteristic selection>(b-17), <Analog speed command upper limit speed> (b-18) and <Analog speed command lower limit speed> (b-19).

•Pulse train input (G-06=3)

When this function is used in pulse train, set the SW4 on the P board to “1” side, and pulse signal of duty1:1 is input between the terminals [AIN3] and [G-IN] with voltage of 0 to 15V. Setting characteristics are same as the characteristics of voltage input (0 to 10V), therefore, please replace the item described in “0 to 10V” with “0 to 150kHz” for this setting. For more information about the voltage input (0 to 10V), please refer to Chapter4 4.3 b-area.

Analog input (3) limit setting (when I066-Z option is used)

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-07	Analog input(3) upper limit speed	Absolute value of Analog input(3) lower limit speed (G-08) to 100.0	0.1	100.0	%
G-08	Analog input(3) lower limit speed	-Analog input(3) upper limit speed (G-07) to Analog input (3) upper limit speed (G-07)	0.1	0.0	%

This setting is available when I066-Z option is used. Set the upper and lower limits of the speed in % relative to the maximum speed when analog input set in the Analog input(3) characteristics selection (G-06) is input in the analog input terminal AIN3 as a speed command. For more information, please refer to user manual of the option.

Analog output (2) characteristic selection (when I066-Z option or digital communication option is used)

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-09	Analog output(2) characteristics selection	0: Output voltage 1: Output current 2: Torque command 3: Motor speed 4: Motor speed command 5: Built-in PLC output 6: Calibration 7: Internal monitor		1	

For more information, please refer to user manual of the option.

Analog output (3) characteristic selection (when I066-Z option is used)

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-10	Analog output(3) characteristics selection	0: Output voltage 1: Output current 2: Torque command 3: Motor speed 4: Motor speed command 5: Built-in PLC output 6: Calibration 7: Internal monitor 8: Output voltage (4 to 20mA) 9: Output current (4 to 20mA) 10: Torque command (4 to 20mA) 11: Motor speed (4 to 20mA) 12: Motor speed command (4 to 20mA) 13: Built-in PLC output (4 to 20mA) 14: Calibration (12mA output)		0	

For more information, please refer to user manual of the option.

Analog output set at G-09 (Selection items 0 to 7)

Analog output set at G-10 (Selection items 0 to 14)

	Selection items	Output voltage		Selection items	Output current
0	Output voltage	7.5V/200V (200V class) 7.5V/400V (400V class)	8	Output voltage	16mA/200V (200V class) 16mA/400V (400V class)
1	Output current	5V/inverter rated current	9	Output current	12mA/ inverter rated current
2	Torque command	5V/100%	10	Torque command	12mA/100%
3	Motor speed	10V/Maximum speed (A-00)	11	Motor speed	20mA/Maximum speed (A-00)
4	Motor speed command (after accel/decel control)	10V/Maximum speed (A-00)	12	Motor speed command (after accel/decel control)	20mA/Maximum speed (A-00)
5	Built-in PLC output	5V/ 20000(100%)*	13	Built-in PLC output	12mA/ 20000(100%)*
6	Calibration	Outputs 5V	14	Calibration	Outputs 12mA
7	Internal monitor				

* Please refer to the function description of Control Block Editor.

Note: When output of 4 to 20mA is used, please refer to user manual of the option.

Analog input (4) characteristic selection (when IOEXT66-Z option is used)

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-11	Analog input(4) characteristics selection	0: 0 to $\pm 10V$ 1: 0 to 10V 2: 4 to 20mA		1	

Select the input characteristic of the analog input terminal AIN4 of the IOEXT66-Z option. For more information, please refer to user manual of the option.

Analog input (5) characteristic selection (when IOEXT66-Z option is used)

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-12	Analog input(5) characteristics selection	0: 0 to $\pm 10V$ 1: 0 to 10V 2: not use 3: Pulse train (0[Hz] to 150[kHz])		1	

Select the input characteristic of the analog input terminal AIN5 of IOEXT66-Z option. For more information, please refer to user manual of the option.

Analog output (4) characteristic selection (when IOEXT66-Z option is used)

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-13	Analog output(4) characteristics selection	0: Output voltage 1: Output current 2: Torque command 3: Motor speed 4: Motor speed command 5: Built-in PLC output 6: Calibration 7: Internal monitor		2	

For more information, please refer to user manual of the option.

Analog output (5) characteristic selection (when IOEXT66-Z option is used)

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-14	Analog output(5) characteristics selection	0: Output voltage 1: Output current 2: Torque command 3: Motor speed 4: Motor speed command 5: Built-in PLC output 6: Calibration 7: Internal monitor 8: Output voltage (4 to 20mA) 9: Output current (4 to 20mA) 10: Torque command (4 to 20mA) 11: Motor speed (4 to 20mA) 12: Motor speed command (4 to 20mA) 13: Built-in PLC output (4 to 20mA) 14: Calibration (12mA output)		3	

For more information, please refer to user manual of the option.

Analog output selected by G-13 (Selection items 0 to 7)

Analog output selected by G-14 (Selection items 0 to 14)

	Selection items	Output voltage		Selection items	Output current
0	Output voltage	7.5V/200V (200V class) 7.5V/400V (400V class)	8	Output voltage	16mA/200V (200V class) 16mA/400V (400V class)
1	Output current	5V/inverter rated current	9	Output current	12mA/ inverter rated current
2	Torque command	5V/100%	10	Torque command	12mA/100%
3	Motor speed	10V/Maximum speed (A-00)	11	Motor speed	20mA/Maximum speed (A-00)
4	Motor speed command (after accel/decel control)	10V/Maximum speed (A-00)	12	Motor speed command (after accel/decel control)	20mA/Maximum speed (A-00)
5	Built-in PLC output	5V/ 20000(100%)*	13	Built-in PLC output	12mA/ 20000(100%)*
6	Calibration	Outputs 5V	14	Calibration	Outputs 12mA
7	Internal monitor				

* Please refer to the function description of Control Block Editor.

Note: When output of 4 to 20mA is used, please refer to user manual of the IOEXT66.

Line speed setting

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-15	Line speed monitor adjustment	0.0 to 2000.0	0.1	0.0	

Adjust the display gain of the console monitor "Line speed".


Set the line speed at the Maximum speed (A-00).

In the line speed monitor, following message is displayed:

Motor speed × Line speed monitor adjustment (G-15) / Maximum speed (A-00)

Analog input monitor display selection

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
G-16	Analog input monitor display selection	1: Analog input (1) [AIN1] 2: Analog input (2) [AIN2] 3: Analog input (3) [AIN3] 4: Analog input (4) [AIN4] 5: Analog input (5) [AIN5]		1	

Set the channel of analog input to be displayed on the console monitor 

(G-16) = 1: Displays on "Vin" that the voltage value input to the analog input (1) terminal [AIN1] on the terminal block of the VFC66-Z board.

(G-16) = 2: Displays on "Vin" that the voltage value input to the analog input (2) terminal [AIN2] on the terminal block of the I066-Z option board or communication option board.

(G-16) = 3: Displays on "Vin" that the voltage value input to the analog input (3) terminal [AIN3] on the terminal block of the I066-Z option board.

(G-16) = 4: Displays on "Vin" that the voltage value input to the analog input (4) terminal [AIN4] on the terminal block of the I066-Z option board.

(G-16) = 5: Displays on "Vin" that the voltage value input to the analog input (5) terminal [AIN5] on the terminal block of the I066-Z option board.

Note: For change of monitor items and for monitor item list, please refer to the user manual (basic operation).

4.9. H-area (Multi-function output setting area)

Multi-function input setting items

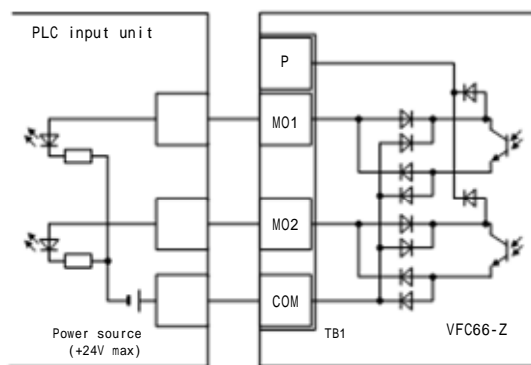
Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
H-00	Multifunction output terminal(1) function selection	0: not used		7	
H-01	Multifunction output terminal(2) function selection	1: Motor speed detection (1) (Motor speed = detection setting)		1	
H-02	Multifunction output terminal(3) function selection	2: Motor speed detection (1) (Motor speed detection setting)		0	
H-03	Multifunction output terminal(4) function selection	3: Motor speed detection (1) (Motor speed detection setting)		8	
H-04	Multifunction output terminal(5) function selection	4: Motor speed detection (2) (Motor speed = detection setting)		2	
H-05	Multifunction output terminal(6) function selection	5: Motor speed detection (2) (Motor speed detection setting)		3	
		6: Motor speed detection (2) (Motor speed detection setting)			
		7: Reach setting			
		8: Torque detection			
		9: Torque detection (absolute value)			
		10: Power failure			
		11: Overload pre-alarm			
		12: Retrying			
		13: in reverse operation			
		14: Protection operation code*			
		15: not used			
		16: in operation			
		17: (For future extension option)*1			
		18: Timer 1 elapse			
		19: Timer 2 elapse			
		20: 2nd set-up block selected			
		21: Fan motor failed			
H-06	Speed detection(1)	~Maximum speed (A-00) to Maximum speed (A-00)	1	0	r/min
H-07	Speed detection(2)	~Maximum speed (A-00) to Maximum speed (A-00)	1	0	r/min
H-08	Speed detection width	0 to 600	1	0	r/min
H-09	Torque detection (with polarity)	-205 to 205	1	0	%
H-10	Torque detection (absolute value)	0 to 205	1	0	%
H-11	Overload pre-alarm operation level setting	0 to 100	1	50	%
H-12	Maximum speed reduction rate	50.0 to 100.0	0.1	90.0	%

*1: Selection 17 for H-00 to H-05 is for a future extension option. Under normal conditions, please do not use this setting.

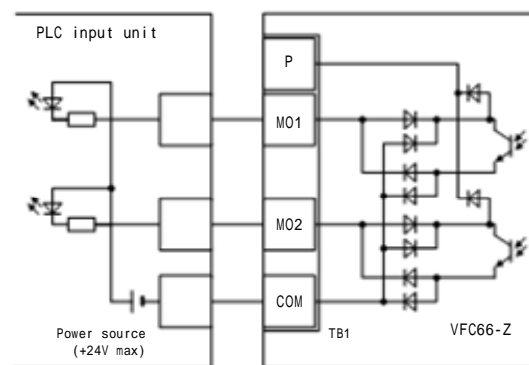
The multi-function output terminals (1) - (2) ([M01] - [M02] terminal block*1) on the VFC66-Z P board will be set as the output terminal blocks for each function of the multi-function output set by the Multifunction output terminal function selection (H-00) - (H-05). The terminal blocks [M01] - [M06] are open collector outputs. Note: When the PLC function usage selection (i-00) is ON, the multi-function output terminals ([M01] - [M06] terminal blocks) on the VFC66-Z P board or the option P board will be the output terminals of the PLC function. Following outputs of each function of the multi-function output can be used as the input for the PLC function.

*1: Terminal blocks [M03] - [M06] of the multi-function output terminals (3) - (6) are optional.

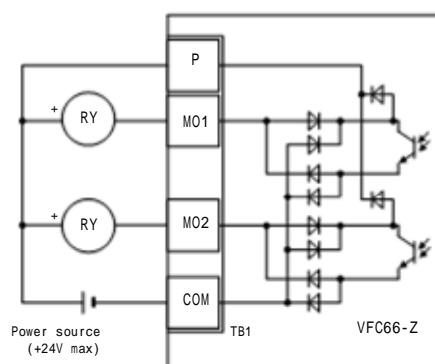
Connection of multi-function output terminal (1) - (2)



1. Connection with PLC (Source mode)



2. Connection with PLC (Sink mode)



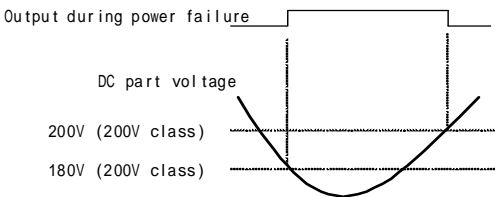
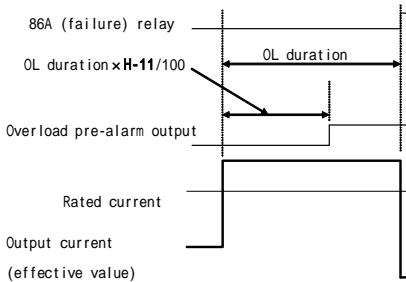
3. Connection with a relay

Above figure is showing typical connection of the multi-function output signal. Multi-function output is the open collector of the transistor and it requires external DC power source. **The maximum permissible voltage is 24V and the maximum permissible current is 20mA per terminal.**

Detailed setting of multi-function output

No.	Items	Description of function
1, 4	Motor speed detection (1) (2) (Speed = detection setting)	<p>Output is turned ON when agreement in speed is made between the Speed detection(1) (2) (H-06, H-07) setting and the \pmSpeed detection width (H-08). Hysteresis width of 0.2% of the Maximum speed (A-00) is set for output. * "Top" in the figure indicates the Maximum speed (A-00).</p> <p>Detected speed (1) output</p> <p>Detected speed (2) output</p> <p>Detected speed (1) (H-06)</p> <p>Hysteresis width 0.2%/Top</p> <p>Detected speed (2) (H-07)</p> <p>Speed detection width (H-08)</p> <p>Rotation speed</p>

No.	Items	Description of function
2, 5	Motor speed detection (1) (2) (Speed detection setting)	<p>Output is turned ON when the speed becomes larger than the setting of the Speed detection (1)(2)(H-06,H-07). (Speed is detected not in absolute value but with sign.)</p>
3, 6	Motor speed detection (1) (2) (Speed detection setting)	<p>Output is turned ON when the speed becomes less than the setting of the Speed detection (1)(2)(H-06,H-07). (Speed is detected not in absolute value but with sign.)</p>
7	Achievement of setting speed	<p>Output is turned ON when the speed achieves $\pm 0.1\%$ of the speed command value.</p>
8	Torque detection	<p>Output is turned ON when the torque command becomes greater than the setting of the Torque detection (with polarity) (H-09).</p>
9	Torque detection (absolute value)	<p>Output is turned ON when absolute value of the torque command becomes greater than the setting of the Torque detection(absolute value) (H-10).</p>

No.	Items	Description of function																																																																																																																																																																
10	During power failure	<div>Output is turned ON when DC part voltage becomes equal to or less than 180V (200V class) / 360V (400V class) and turned OFF when the voltage becomes equal to or more than 200V (200V class) / 400V (400V class). Note: when the power of the control board is not available, then the output is turned OFF.</div> <div></div>																																																																																																																																																																
11	Overload pre-alarm	<div>When it becomes overload condition specified in the Overload protection setting (F-03), overload counter will be initiated and when it becomes greater than the setting level of the Overload pre-alarm operation level setting (H-11), then output is turned ON. The count value in which overload protection is occurred is set as 100%. (e.g. If overcurrent protection is occurred at 150% current for 60 seconds, and if 50% is set to the Overload pre-alarm operation level setting (H-11) and when output current becomes 150%, then it will be ON at 30 seconds which is 50% of the overload protection duration (60 seconds).</div> <div></div>																																																																																																																																																																
12	Retrying	Turned ON for 10 seconds after the protection operation retry. For more information, please refer to F-aria.																																																																																																																																																																
13	Operation in reverse	Turned ON when the motor is reversed. (To prevent chattering around 0 speed, hysteresis of 12rpm (sensor-less control or sensed control) is provided.																																																																																																																																																																
14	Protection operation code	<div>When failure or protection is activated, the code of which protection is activated will be output by using four multi-function output terminals. (Unlike other function, this function requires setting of the protection operation code to four multi-function output terminals.) <List of output code></div> <table><tr><th>Items</th><th>MO1</th><th>MO2</th><th>MO3</th><th>MO4</th><th>Items</th><th>MO1</th><th>MO2</th><th>MO3</th><th>MO4</th></tr><tr><td>Overcurrent protection</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>Speed control error</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td></tr><tr><td>IGBT protection</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>Sensor-less start error</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td></tr><tr><td>Unit overheat</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>Sensor error</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td></tr><tr><td>Abnormality in parallel slave</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>PG error</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td></tr><tr><td>Charging resistance overheat</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>CPU abnormality</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td></tr><tr><td>DC part overvoltage</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>Memory abnormality</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td></tr><tr><td>Overload protection</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>Option error</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td></tr><tr><td>FCL protection</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>Communication timeout error</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td></tr><tr><td>Overtorque protection</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>Inadequate voltage (Power failure)</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>Motor overheat</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>Setting error</td><td>ON</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>Abnormality in current sensor</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>External failure 1</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>Phase loss</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>External failure 2</td><td>ON</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>Starting jam</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>External failure 3</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td></tr><tr><td>Overspeed protection</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td><td>External failure 4</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr><tr><td>Overfrequency protection</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td><td></td><td></td><td></td><td></td><td></td></tr></table>	Items	MO1	MO2	MO3	MO4	Items	MO1	MO2	MO3	MO4	Overcurrent protection	ON	OFF	OFF	OFF	Speed control error	ON	ON	ON	OFF	IGBT protection	OFF	ON	OFF	OFF	Sensor-less start error	ON	ON	ON	OFF	Unit overheat	OFF	ON	OFF	OFF	Sensor error	ON	ON	ON	OFF	Abnormality in parallel slave	OFF	ON	OFF	OFF	PG error	ON	ON	ON	OFF	Charging resistance overheat	OFF	ON	OFF	OFF	CPU abnormality	OFF	OFF	OFF	ON	DC part overvoltage	ON	ON	OFF	OFF	Memory abnormality	OFF	OFF	OFF	ON	Overload protection	OFF	OFF	ON	OFF	Option error	OFF	OFF	OFF	ON	FCL protection	OFF	OFF	ON	OFF	Communication timeout error	ON	OFF	OFF	ON	Overtorque protection	OFF	OFF	ON	OFF	Inadequate voltage (Power failure)	OFF	ON	OFF	ON	Motor overheat	OFF	OFF	ON	OFF	Setting error	ON	ON	OFF	ON	Abnormality in current sensor	ON	OFF	ON	OFF	External failure 1	OFF	OFF	ON	ON	Phase loss	ON	OFF	ON	OFF	External failure 2	ON	OFF	ON	ON	Starting jam	OFF	ON	ON	OFF	External failure 3	OFF	ON	ON	ON	Overspeed protection	ON	ON	ON	OFF	External failure 4	ON	ON	ON	ON	Overfrequency protection	ON	ON	ON	OFF					
Items	MO1	MO2	MO3	MO4	Items	MO1	MO2	MO3	MO4																																																																																																																																																									
Overcurrent protection	ON	OFF	OFF	OFF	Speed control error	ON	ON	ON	OFF																																																																																																																																																									
IGBT protection	OFF	ON	OFF	OFF	Sensor-less start error	ON	ON	ON	OFF																																																																																																																																																									
Unit overheat	OFF	ON	OFF	OFF	Sensor error	ON	ON	ON	OFF																																																																																																																																																									
Abnormality in parallel slave	OFF	ON	OFF	OFF	PG error	ON	ON	ON	OFF																																																																																																																																																									
Charging resistance overheat	OFF	ON	OFF	OFF	CPU abnormality	OFF	OFF	OFF	ON																																																																																																																																																									
DC part overvoltage	ON	ON	OFF	OFF	Memory abnormality	OFF	OFF	OFF	ON																																																																																																																																																									
Overload protection	OFF	OFF	ON	OFF	Option error	OFF	OFF	OFF	ON																																																																																																																																																									
FCL protection	OFF	OFF	ON	OFF	Communication timeout error	ON	OFF	OFF	ON																																																																																																																																																									
Overtorque protection	OFF	OFF	ON	OFF	Inadequate voltage (Power failure)	OFF	ON	OFF	ON																																																																																																																																																									
Motor overheat	OFF	OFF	ON	OFF	Setting error	ON	ON	OFF	ON																																																																																																																																																									
Abnormality in current sensor	ON	OFF	ON	OFF	External failure 1	OFF	OFF	ON	ON																																																																																																																																																									
Phase loss	ON	OFF	ON	OFF	External failure 2	ON	OFF	ON	ON																																																																																																																																																									
Starting jam	OFF	ON	ON	OFF	External failure 3	OFF	ON	ON	ON																																																																																																																																																									
Overspeed protection	ON	ON	ON	OFF	External failure 4	ON	ON	ON	ON																																																																																																																																																									
Overfrequency protection	ON	ON	ON	OFF																																																																																																																																																														

No.	Items	Description of function
16	In operation	Turned ON during the operation of the motor.
18	Timer 1 elapse	Turned ON when cumulative operation time becomes greater than the setting value of the Cumulative operation timer(1-Capacitor) (F-04).
19	Timer 2 elapse	Turned ON when cumulative operation time becomes greater than the setting value of the Cumulative operation timer(2-Fan) (F-05).
20	2nd set-up block selected	Turned ON when the 2nd set-up block is selected.
21	Fan motor failed	Turned ON when fan motor is failed.

4.10. i-area (Droop control, mechanical loss compensation setting area)

PLCL function selection

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
i-00	PLCL function usage selection	OFF (not use) ON (use)		OFF	

Turn ON when PLCL function is used. Please set it to OFF under normal conditions.

For more information, please refer to description of PLC function in the separate booklet <VF66 series PC Tool user manual>.

PLCH function selection

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
i-01	PLCH function usage selection	0: OFF (not use) 1: PLCH ON 2: PLCH ON (speed command input = PLCH output)		0	

Select 1 or 2 when PLCH function is used. Please set it to 0 under normal conditions.

Note: When 2 is selected for the PLCH function usage selection (i-01);

- When the operation command is ON, the motor will immediately start rotating at the speed set in the Speed command (0.SrEF) regardless of the setting of the Acceleration (1) (3.Acc1).
- When the operation command is OFF, it becomes free stop.

For more information, please refer to description of PLC function in the separate booklet <VF66 series PC Tool user manual>.

Droop control setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
i-02	Droop control usage selection	OFF (not use) ON (use)		OFF	
i-03	Droop start speed	0.0 to 100.0	0.1	0.0	%
i-04	Droop rate changeover speed	0.0 to 100.0	0.1	0.0	%
i-05	Droop rate	0.0 to 50.0	0.1	0.0	%
i-06	Droop start torque	0.0 to 90.0	0.1	0.0	%

Note: Droop start speed (i-03) and Droop rate changeover speed (i-04) are set in % with respect to the Maximum speed (A-00).

Set-up each setting of droop control for the purpose such as balancing of torques between two motors.

Droop control usage selection (i-02):

Select ON/OFF of the droop control.

Droop start speed (i-03):

Starts droop control when the speed becomes equal to or greater than the Droop start speed (i-03). (When speed drops to this speed or less, then it will limit speed at this speed.)

Droop rate changeover speed (i-04):

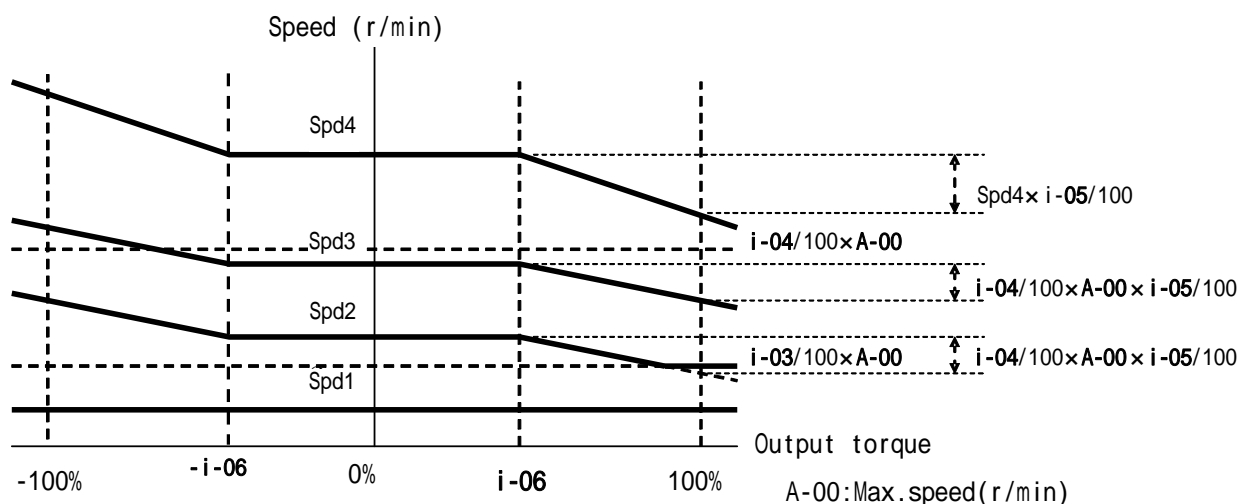
When the speed command becomes equal to or greater than the Droop rate changeover speed (i-04), amount of droop will be based on the speed command. When the speed is less than the Droop rate changeover speed (i-04), amount of droop will be based on the Droop rate changeover speed (i-04). (In order to droop entirely with the rate relative to the speed command (0.SrEF), set 0.0% to the Droop rate changeover speed (i-04).)

Droop rate (i-05):

Set the droop amount at 100% torque command in rate of droop amount (%) relative to reference speed (when the speed is equal to or greater than the Droop rate changeover speed (i-04), then it will be speed command and when the speed is less than the Droop rate changeover speed (i-04), then it will be the setting of the Droop rate changeover speed (i-04). In order to droop entirely with the rate relative to the Maximum speed (A-00), set 100% to the Droop rate changeover speed (i-04).)

Droop start torque (i-06):

Droop will not be activated if the torque is below this torque setting.



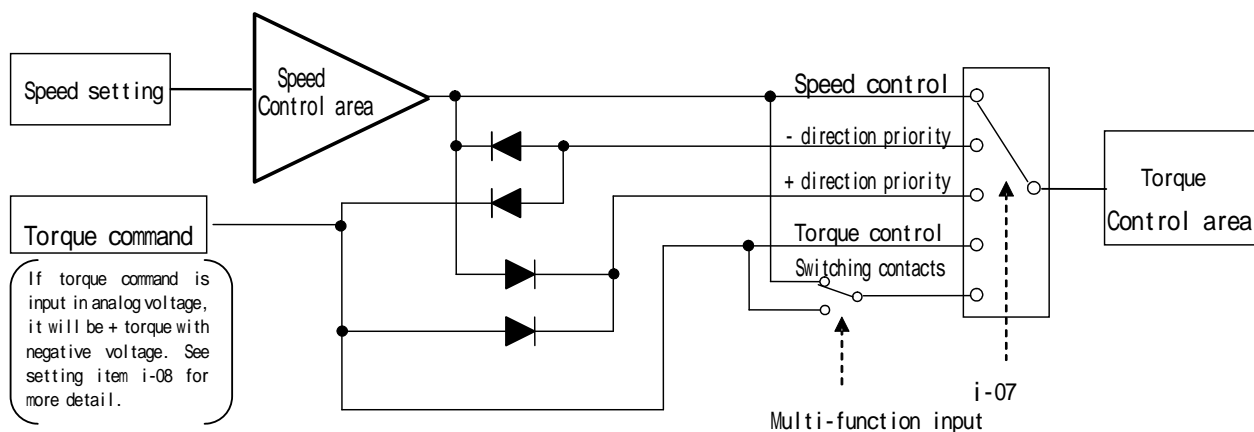
Droop control characteristic

Operation mode selection (Speed control / torque control)

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
i-07	Operation mode selection	0: Speed control (ASR) mode 1: Torque command - direction priority 2: Torque command + direction priority 3: Torque control (ATR) mode 4: Speed/torque control contact switch		0	

Select operation mode (Speed control / torque control / Priority). It can be combined with the multi-function

input and can be switched from external contacts.



Operation mode selection

Torque command input place selection

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
i-08	Torque command input place selection	0: Analog input (1) [terminal block](AIN1) 1: Analog input (2) [I066-Z option or digital communication option](AIN2) 2: Digital communication option 3: Built-in PLC output		1	

Set the torque command input place when torque control mode is selected.

AIN1: Input from [AIN1] terminal of VFC66-Z P board .

AIN2: Input from [AIN2] terminal of I066-Z P board or communication option P board .

Digital communication option: Input from digital communication option.

Built-in PLC output: Torque command by PLC. (Please refer to "VF66 series PC Tool user manual" for more information)

*If Analog input (1) or Analog input (2) is selected for the torque command input place, set the analog input characteristic to 0 to $\pm 10V$.

Torque command characteristic when input from terminal block or analog option is as shown in figure below (in description of i-09):

Analog input torque command gain

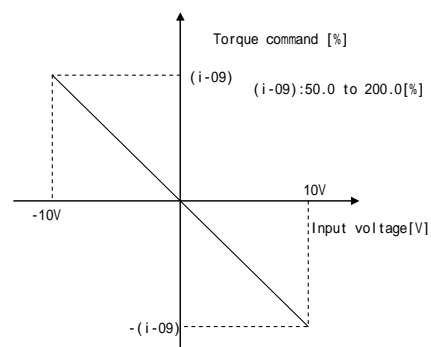
Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
i-09	Analog torque command gain	50.0 to 200.0	0.1	150.0	%

Setting of torque command gain relative to analog input. Right figure shows the characteristic.

If torque command is input in analog voltage, it will be + torque with negative voltage.

*If Analog input (1) or Analog input (2) is selected for the torque command input place, set the analog input characteristic to 0 to $\pm 10V$.

*If Analog torque command gain (i-09) is set to 100.0, then torque command will be 100% with input voltage of 10V.



Analog input torque command gain

Change of speed control gain in Jog

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
i-10	Speed control proportion gain(2)	3 to 100	1	15	
i-11	Speed control integral time constant(2)	20 to 10000	1	40	msec
i-12	Speed control system moment of inertia(2)	0 to 65535	1	10	gm ²

The speed control proportional gain used in Jog when “1” is selected for the JOG proportion gain selection (i-13).

For more information about speed control proportional gain, please refer to setting of speed control proportional gain in Chapter4 4.1 <Basic setting area>.

Jog proportional gain selection

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
i-13	JOG proportion gain selection	0: Use 7 - 9 of basic setting area 1: Speed control proportion gain(2) (i-10) to Speed control system Moment of inertia(2) (i-12) 2: Special mode		0	

Set proportional gain, time constant and moment of inertia used in Jog operation.

0: Setting values of Speed control proportion gain(1) (7.ASrP), speed control integral time constant (1) (8.ASrI) and Speed control system moment of inertia(1) (9.ASrJ) of basic area are used for Jog.

1: Use values of i-10 through i-12 for Jog.

2: Special mode. Values of i-10 through i-12 are used for Jog. In addition, values of i-10 through i-12 is used even when the speed command is 5.56% or less.

Speed control (ASR) selection

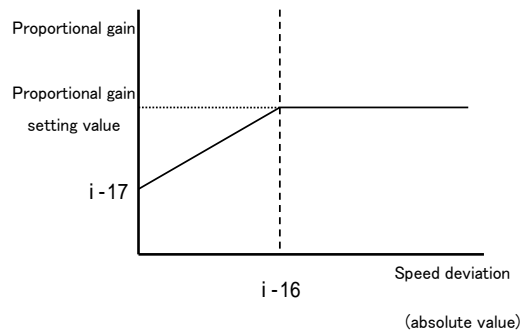
Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
i-14	ASR cancelation usage selection	OFF (not use) ON (use)		ON	
i-15	ASR feed-forward usage selection	OFF (not use) ON (use)		ON	

In VF66B, combine the cancelation using disturbance observer and the feed forward together to comprise robust speed control (MFC control). Cancelation and feed forward can be turned OFF independently. (If both are turned OFF, it will be same as conventional PI control.) For more information, please refer to speed control proportional gain in Chapter4 4.1 <Basic setting area>.

Adjustment of variable structure proportional gain

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
i-16	Variable structure proportion gain start speed	0.01 to 100.00	0.01	5.00	%
i-17	Variable structure proportion gain minimum gain percentage	0 to 500	1	100	%

The minimum gain rate value of the Variable structure proportion gain minimum gain percentage (i-17) will be 0.2 times of the value when 0 (S-mode sensor-less drive [without PG]) is selected for the PG selection (A-10). The variable structure proportional gain which varies proportional gain is adjusted by the degree of deviation between speed command and motor speed.



Variable structure proportional gain

Mode selection at initial excitation (Sensored vector control)

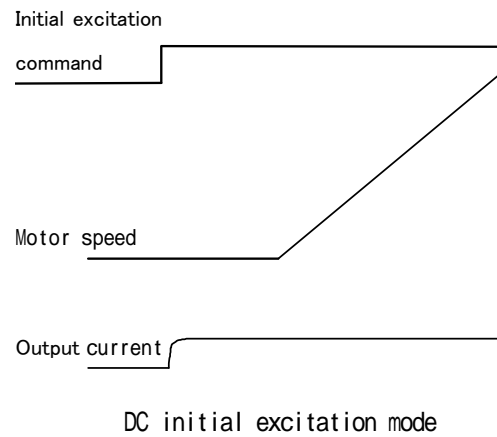
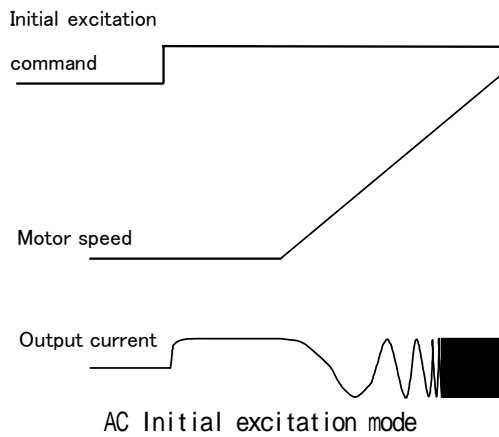
Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
i-18	Initial excitation selection	0: AC initial excitation 1: DC initial excitation		1	

Select the mode of initial excitation.

AC initial excitation: Frequency will be adjusted for motor speed so that torque is not produced when the motor is turned during the initial excitation.

DC initial: Keep DC of the exciting current component even if the motor is turned during the initial excitation.

Note: AC initial excitation mode is not available in sensor-less vector control.



Mechanical loss compensation setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
i-19	Mechanical loss compensation usage selection	OFF (not use) ON (use)		OFF	
i-20	Mechanical loss offset amount	0 to 100	1	0	%
i-21	Gradient of mechanical loss	0 to 100	1	0	%

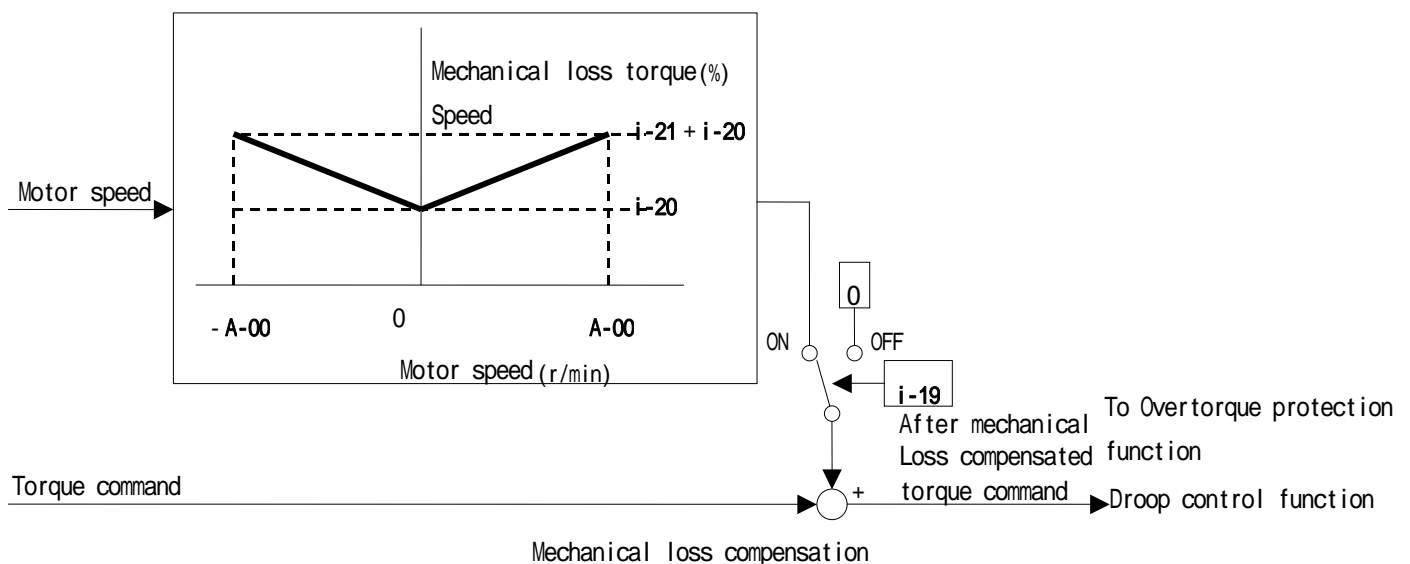
Mechanical loss compensation torque command, which mechanical loss is deducted from the torque command used for overtorque protection or droop control, can be used.

Note: No compensation is available for the torque command input in torque control. In addition, no compensation is available for torque command monitor display either.

Mechanical loss compensation selection (i-19): Select ON/OFF of the Mechanical loss compensation. (When OFF is selected, the value without mechanical loss compensation will be used for overtorque control or droop control.)

Mechanical loss offset amount (i-20): Set the mechanical loss offset amount at 0 speed as 100% rated torque.

Gradient of mechanical loss (i-21): Set the motor speed proportion of the mechanical loss in torque at the maximum speed.



Positing control setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
i-22	Positing speed(0)	16 to 200	1	100	r/min
i-23	Positing speed(1)	16 to 200	1	100	r/min
i-24	Positing acceleration time	0.1 to 10.0	0.1	0.5	sec
i-25	Positing deceleration time	0.1 to 10.0	0.1	0.5	sec
i-26	Creep speed	2 to 16	1	2	r/min
i-27	Number of moving pulse within a creep period	40 to 400	1	40	
i-28	Number of stop pulse	-50 to 50	1	0	
i-29	Positioning emergency stop selection	OFF (without positioned emergency stop) ON (with positioned emergency stop)		OFF	
i-30	Proportion gain for positioning	3 to 100	1	15	
i-31	Integral time constant for positioning	20 to 10000	1	40	msec
i-32	System moment of inertia for positioning	0 to 65535	1	10	gm ²

i-22 through i-32: The setting when ASYC66 option is used in special mode. Under normal conditions, please stay on the factory default value.

4.11. J-area (Digital communication option setting area)

Digital communication option setting

Display	Items	Set-up range (Item selection)		Set-up resolution	Default data	Unit																																																																
J-00	Digital communication option selection	0: OFF 1: OPCN66-Z 2: ASYC66-Z 3: DNET66-Z 4: PBUS66-Z 5: I066-Z 6: (For future extension option)* ¹ 7: CC66-Z			0																																																																	
J-01	ASYC66-Z/CC66-Z option baud rate	(ASYC66-Z) 0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps	(CC66-Z) 0: 156kbps 1: 625kbps 2: 2.5Mbps 3: 5Mbps 4: 10Mbps 5: 10Mbps		4																																																																	
J-02	OPCN66-Z option baud rate	0: 125kbps 1: 250kbps 2: 500kbps 3: 1Mbps 4: (For factory adjustment) * ²			3																																																																	
J-03	PBUS66-Z slave address	0 to 126		1	2																																																																	
J-04	OPCN66-Z option input	3 to 19		1	14																																																																	
J-05	OPCN66-Z option output	2 to 12		1	6																																																																	
J-06	(For future extension option)	Please stay on the default value.			0																																																																	
J-07	ASYC66-Z/OPCN66-Z transmission selection/CC66-Z version selection	(ASYC66-Z) 0: 0ms 1: 5ms 2: 10ms 3: 20ms 4: 40ms 5: 60ms 6: 100ms (CC66-Z) <table><tr><th>Version</th><th>Exclusive station</th></tr><tr><td>0: 1.1</td><td>1</td></tr><tr><td>1: 1.1</td><td>2</td></tr><tr><td>2: 1.1</td><td>3</td></tr><tr><td>3: 1.1</td><td>4</td></tr><tr><td>4: 2.0(2×)</td><td>1</td></tr><tr><td>5: 2.0(4×)</td><td>1</td></tr><tr><td>6: 2.0(8×)</td><td>1</td></tr></table>	Version	Exclusive station	0: 1.1	1	1: 1.1	2	2: 1.1	3	3: 1.1	4	4: 2.0(2×)	1	5: 2.0(4×)	1	6: 2.0(8×)	1	(OPCN66-Z) Baud rate (J-02)[bps] <table><tr><th colspan="2">125k</th><th>250k</th></tr><tr><td>0: 200μs</td><td>200μs</td><td>200μs</td></tr><tr><td>1: 200μs</td><td>200μs</td><td>200μs</td></tr><tr><td>2: 200μs</td><td>200μs</td><td>200μs</td></tr><tr><td>3: 200μs</td><td>200μs</td><td>200μs</td></tr><tr><td>4: 200μs</td><td>150μs</td><td>150μs</td></tr><tr><td>5: 200μs</td><td>100μs</td><td>100μs</td></tr><tr><td>6: 200μs</td><td>100μs</td><td>100μs</td></tr></table> Baud rate (J-02)[bps] <table><tr><th colspan="2">500k</th><th>1M</th></tr><tr><td>0: 200μs</td><td>200μs</td><td>200μs</td></tr><tr><td>1: 200μs</td><td>200μs</td><td>200μs</td></tr><tr><td>2: 200μs</td><td>200μs</td><td>200μs</td></tr><tr><td>3: 200μs</td><td>200μs</td><td>200μs</td></tr><tr><td>4: 150μs</td><td>150μs</td><td>150μs</td></tr><tr><td>5: 100μs</td><td>100μs</td><td>100μs</td></tr><tr><td>6: 50μs</td><td>50μs</td><td>50μs</td></tr></table>	125k		250k	0: 200μs	200μs	200μs	1: 200μs	200μs	200μs	2: 200μs	200μs	200μs	3: 200μs	200μs	200μs	4: 200μs	150μs	150μs	5: 200μs	100μs	100μs	6: 200μs	100μs	100μs	500k		1M	0: 200μs	200μs	200μs	1: 200μs	200μs	200μs	2: 200μs	200μs	200μs	3: 200μs	200μs	200μs	4: 150μs	150μs	150μs	5: 100μs	100μs	100μs	6: 50μs	50μs	50μs		0	
Version	Exclusive station																																																																					
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5: 100μs	100μs	100μs																																																																				
6: 50μs	50μs	50μs																																																																				
J-08	ASYC66-Z/PBUS66-Z communication mode selection	(ASYC66-Z) 0: standard mode 1: Positioning mode 1 2: positioning mode 2	(PBUS66-Z) 0: PROFIDRIVE mode 1: Factory original mode 2: Special mode		0																																																																	
J-09	DNET66-Z output instance number setting	0: Instance No.20 1: Instance No.21 2 to 10: (Factory original communication mode)			0																																																																	

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
J-10	DNET66-Z input instance number setting	0: Instance No.70 1: Instance No.71 2 to 15: (Factory original communication mode)		0	
J-11	DNET66-Z speed scale setting	-126 to 127		3	
J-12	DNET66-Z monitor data number setting	0 to 119		3	
J-13	HighSpeed response input selection	0: Communication 1: Analog input (2)(AIN2)		0	
J-14	Date/Time data selection from communication	0: without date/time data 1: with date/time data		0	
J-15	Connected number of outside DB(Dynamic Brake) units with communication	0 to 6	1	0	

*1: J-00=6 is for a future extension option. Under normal conditions, please do not use this setting.

*2: J-02=4 is for factory adjustment. Under normal conditions, please stay on the factory setting.

J-00:

Operable with either this setting is OFF or the digital communication option is selected for speed commanding place or operation commanding place, and multi-function input is also operable, however, no option error check is executed so that please set appreciate value for the option installed. Note: Selecting the value other than 0 when no option is connected causes option error and brings inverter trip.

J-01 through 08:

This is the setting when ASYC66-Z (asynchronous RS485, RS422-A and RS232C communication option), OPCN66-Z (OPCN-1 communication option), PBUS66-Z (PROFIBUS communication option) or CC66-Z (CC-Link communication option) is used. Please refer to instruction manual of each option. Under normal conditions, please stay on the factory default value.

J-09 through 12:

This is the setting when DNET66-Z (DeviceNet communication option) is used. Please refer to instruction manual of DNET66-Z option for more information.

J-13:

It is recommended that select "1" for the HighSpeed response input selection (J-13) when "1" (Analog input (2) [AIN2]) is selected for the Torque command input place selection (i-08), and select "0" for the HighSpeed response input selection (J-13) when "2" (communication) is selected for the Torque command input place selection (i-08). With this setting, high-speed downloading of torque command input value becomes possible.

J-14:

Select with or without of date-hour data from the digital communication option.

J-15:

The number describing how many external DB option (regeneration brake) connected with communication function.

For more information, please refer to instruction manual of each option.

4.12. L-area (Input gain, output gain setting area)

Vdc detection gain setting

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
L-00	Vdc detection gain	80.0 to 120.0	0.1	100.0	%

Detection adjusting gain for the DC voltage detected by VF66B.

Note: This Vdc gain will be back calculated and set by inputting the voltage between $\oplus 2 - \ominus$ at the time of memory initialization. Under normal conditions please stay on the factory default value. When the main printed circuit board (such as GAC66-Z or MAC66-Z) is replaced, difference may occur between "Vdc" on the console display and actual voltage between $\oplus 2 - \ominus$. Please refer to Chapter4 4.16 S-area <Vdc detection gain automatic adjustment> if you want to adjust Vdc detection gain without initializing memory under the situation above.

Analog input/output gain offset adjustment

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
L-01	Analog input(1) gain	50.00 to 150.00	0.01	Adjusted	%
L-02	Analog input(1) offset	-50.00 to 50.00	0.01	Adjusted	%
L-03	Analog output(1) gain	50.0 to 150.0	0.1	Adjusted	%
L-04	Analog output(1) offset	-50.0 to 50.0	0.1	Adjusted	%
L-05	Analog input(2) gain	50.00 to 150.00	0.01	100.00	%
L-06	Analog input(2) offset	-50.00 to 50.00	0.01	0.00	%
L-07	Analog input(3) gain	50.00 to 150.00	0.01	100.00	%
L-08	Analog input(3) offset	-50.00 to 50.00	0.01	0.00	%
L-09	Analog output(2) gain	50.0 to 150.0	0.1	100.0	%
L-10	Analog output(2) offset	-50.0 to 50.0	0.1	0.0	%
L-11	Analog output(3) gain	50.0 to 150.0	0.1	100.0	%
L-12	Analog output(3) offset	-50.0 to 50.0	0.1	0.0	%
L-13	Analog input(4) gain	50.00 to 150.00	0.01	100.00	%
L-14	Analog input(4) offset	-50.00 to 50.00	0.01	0.00	%
L-15	Analog input(5) gain	50.00 to 150.00	0.01	100.00	%
L-16	Analog input(5) offset	-50.00 to 50.00	0.01	0.00	%
L-17	Analog output(4) gain	50.0 to 150.0	0.1	100.0	%
L-18	Analog output(4) offset	-50.0 to 50.0	0.1	0.0	%
L-19	Analog output(5) gain	50.0 to 150.0	0.1	100.0	%
L-20	Analog output(5) offset	-50.0 to 50.0	0.1	0.0	%

L-01 through L-20 are setting areas for adjusting gain and offset of the analog inputs/outputs.

It will be automatically set by analog output/input adjustment of S-area.

* For more information about S-area, please refer to Chapter3 3.16 S-area <Mode selection, analog input/output adjusting area> as well as Chapter4 4.16 <Mode selection, analog input/output adjusting area>.

Inverter operation mode monitor setting

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
L-21	Inverter operation mode monitor	SnPL (SIMPLE mode) FuLL (FULL mode)		SnPL	

Inverter operation mode monitor (L-21) is available only for indication. "FuLL" is displayed when the inverter operation mode is FULL mode.

For the switching method to FULL mode, please refer to Chapter1 1.3 <Method to change to FULL mode>.

4.13. n-area (monitor adjusting area)

Confirmation of inverter mode

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
n-00	Inverter control mode	o: Induction motor V/f mode V: Induction motor vector mode E: ED motor vector mode		o	

The inverter mode which has been set can be confirmed by reading out this setting.

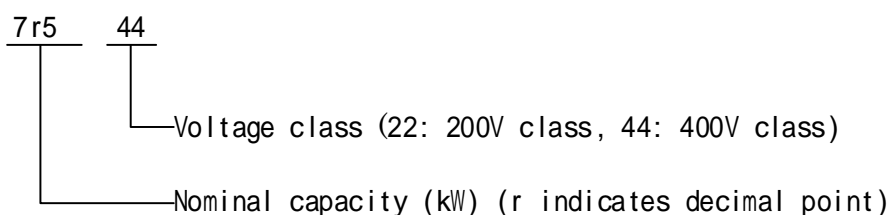
Note: This setting is only for read out and is not writable (writing is always prohibited in this setting).

Please refer to Chapter1 1.2 <Method to switch into Induction motor vector mode> if you change the inverter mode.

Confirmation of inverter capacity and voltage class

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
n-01	Capacity/Voltage class	2r222 to 9022 2r244 to 31544		Equivalent to rating of inverter	

Capacity and voltage class of current inverter setting can be confirmed by reading out this setting.



Note: This setting is only for read out and is not writable (writing is always prohibited in this setting). In case if capacity/voltage class of the inverter set in the VFC66-Z printed board is changed due to spare parts replacement or etc, then initialization of memory is required. For more information about memory initialization method, please refer to Chapter5 <Replacement of control print board VFC66-Z>.



Inverter Capacity/Voltage class set in the VFC66-Z printed board and Capacity/Voltage class of the inverter which the printed board is installed must be conformed, otherwise normal operation cannot be obtained and may lead to accidents.

4.14. o- area (Factory adjustment area)

Factory adjusting analog output address, factory adjusting SET66-Z output address setting

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
o-00	SpecialAdjustment	0 to 65535			
o-01	SpecialAdjustment	0 to 65535			
o-02	SpecialAdjustment	0 to 65535			
o-03	SpecialAdjustment	0 to 65535			
o-04 to o-53		These are for factory adjustment. Please stay on the factory default value.			

Note: o-area is for factory adjustment and special purpose only and cannot be changed. No indication is displayed on the console monitor. Please stay on the factory default setting. (Error will be indicated if you attempt to write in this area.)

4.15. P-area (Built-in PLC, P resistor setting area)

Built-in PLC P resistor setting area

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
P-00 to 99	P resistor constant setting	See separate booklet "User manual for VF66series PC Tool".			

P-area is a setting area for the built-in PLC function constant. For more information, please refer to <VF66 series PC Tool user manual>. (This setting is unnecessary if built-in PLC is not used.)

Note: The value of -20000 or less cannot be input from the console panel (SET66-Z). If the value of -20000 or less is required to input in PLC function, please use VF66 series PC Tool. For more information, please refer to <VF66 series PC Tool user manual>.

4.16. S-area (Mode selection, analog input/output adjusting area)

Special mode selection

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
S-00	Special mode selection	1: Inverter initialization 2: Inverter mode change 3: Delete protection related 4: Switching between SIMPLE mode and FULL mode 10: FULL mode auto-tuning (forward) 11: FULL mode auto-tuning (reverse) 12: DC mode auto-tuning (forward) 13: DC mode auto-tuning (reverse) 99: Inverter initialization (For factory adjustment) *1 101: Data transfer to SET66EX-Z 102: Data copy (exclude A-area) from SET66EX-Z) 103: Data copy (include A-area) from SET66EX-Z 104: Data comparison with SET66EX-Z			

*1: Under normal conditions, please do not use this setting.

Setting items of the Special mode selection (S-00)

S-00 setting	Description
1	Refer to Chapter5 5.3 <VF66B initialization method> for more detail.
2	Refer to Chapter1 1.2 < Switching to Induction motor vector mode> for more information.
3	Refer to <Protection related erasing method> in this chapter for more detail.
4	For more information about switching between SIMPLE mode and FULL mode, please refer to Chapter1 1.3 <Switching to FULL mode>.
10 to 13	Refer to each item of Chapter1 1.4 <Automatic tuning> for more information about automatic tuning.
99	Under normal conditions, please do not use this setting.
101	For more information about data transfer method to SET66EX-Z, please refer to <Transfer of setting data to external console panel SET66EX-Z> in this chapter.
102	For detail of data copying method from SET66EX-Z (without A-area), please refer to <Copy of setting data from the external console panel SET66EX-Z to the inverter (without involving copy of A-area)> in this chapter.
103	For detail of data copying method from SET66EX-Z (with A-area), please refer to < Copy of setting data from the external console panel SET66EX-Z to the inverter (involving copy of A-area)> in this chapter.
104	For detail of data comparison method with SET66EX-Z, please refer to <Comparison between the data in the inverter (VF66B) and the data of the external console panel SET66EX-Z> in this chapter.

• Protection related erasing method

Explains procedure for erasing protection related items:



Press [MONI/FNC] key and select FNC (function selection) mode. (LED-FNC will lit)



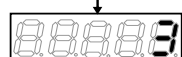
Use [] [] key to select "S-00". Press [SET] key to confirm.



Use [JOG/] key to shift the digit to the right, and [] [] keys to select the number "1040" then press [SET] key to confirm. If you input number except 「1040」, «» is displayed on the console.



"S-00" will appear again. Press [SET] to confirm



Use [JOG/→][↑][↓] keys to enter "3", then press [SET] to confirm.



「CLEAR」 is displayed on the console for 1.5sec.



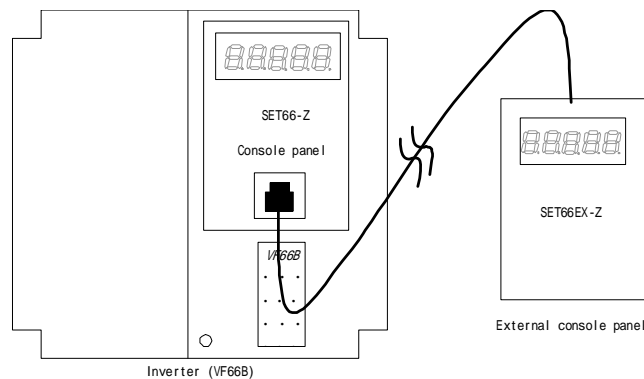
"S-00" will appear again. Data of protection history is erased.



⑧Press [MONI/FNC] key to turn off the LED of FNC. Monitor item such as "SPd" will be displayed for approx. 1sec. and then monitor items of current setting will be displayed.

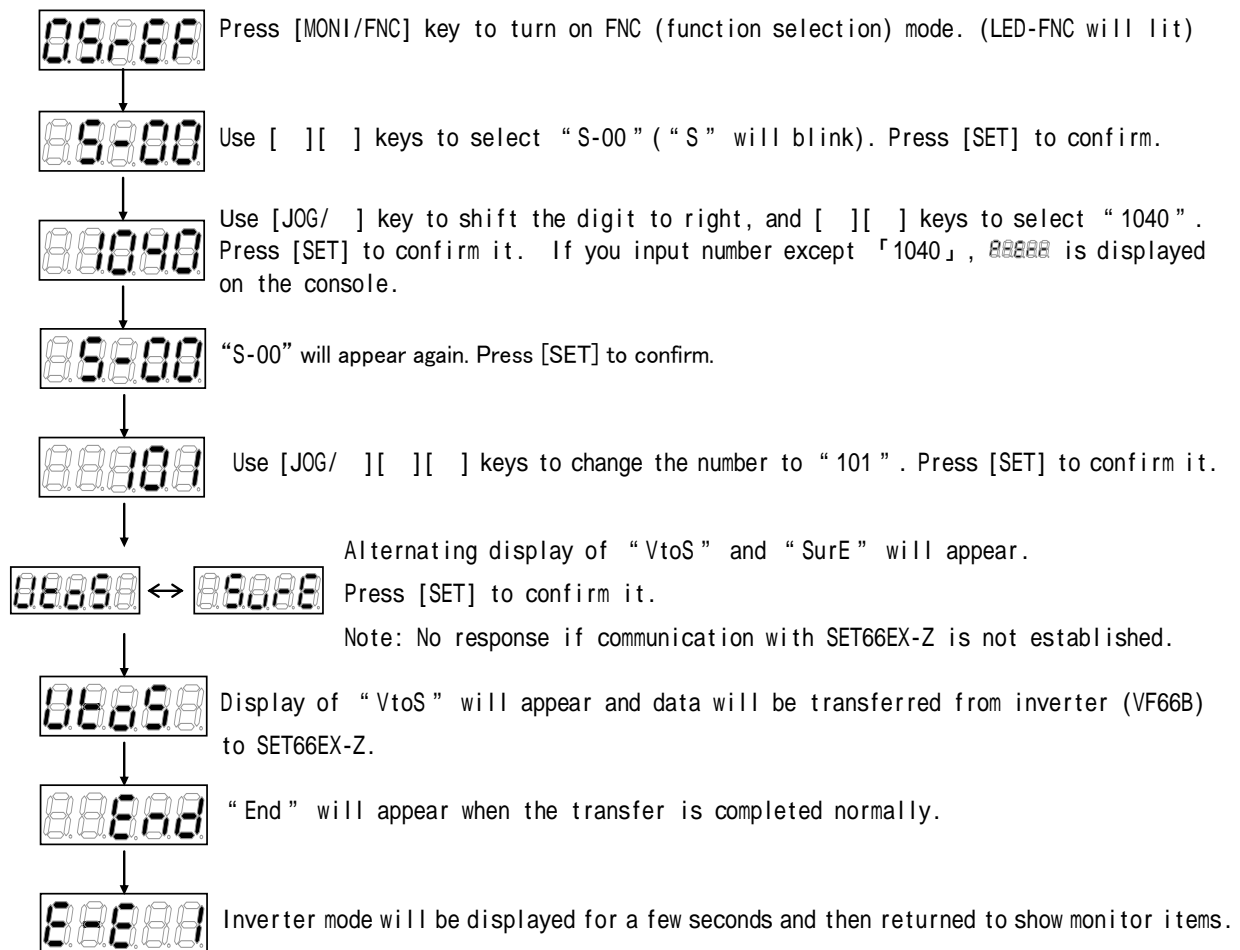
•Transfer of setting data to external console panel SET66EX-Z

Data transferring method from the inverter (VF66B) to the external console panel SET66EX-Z is explained below:



Connect optional external console panel SET66EX-Z with the console panel SET66-Z on the inverter VF66B.

If you connect external console panel SET66EX-Z to the VF66B, you cannot use console panel (SET66-Z) on the VF66B.



Note: If normal communication is disturbed during data transfer, the data transfer is discontinued and display will return to inverter mode indication or is discontinued 10 seconds after the blink indication of **88888**.

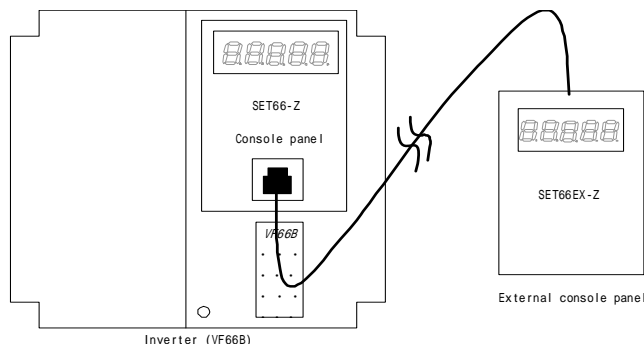
To resume the data transfer, display is inverter mode after the discontinuance and then returns to monitor item indication, please repeat the process from the beginning.

- Copy of setting data from the external console panel SET66EX-Z to the inverter (without involving copy of A-area)

Data transferring method from the inverter (VF66B) to the external console panel SET66EX-Z is explained below.

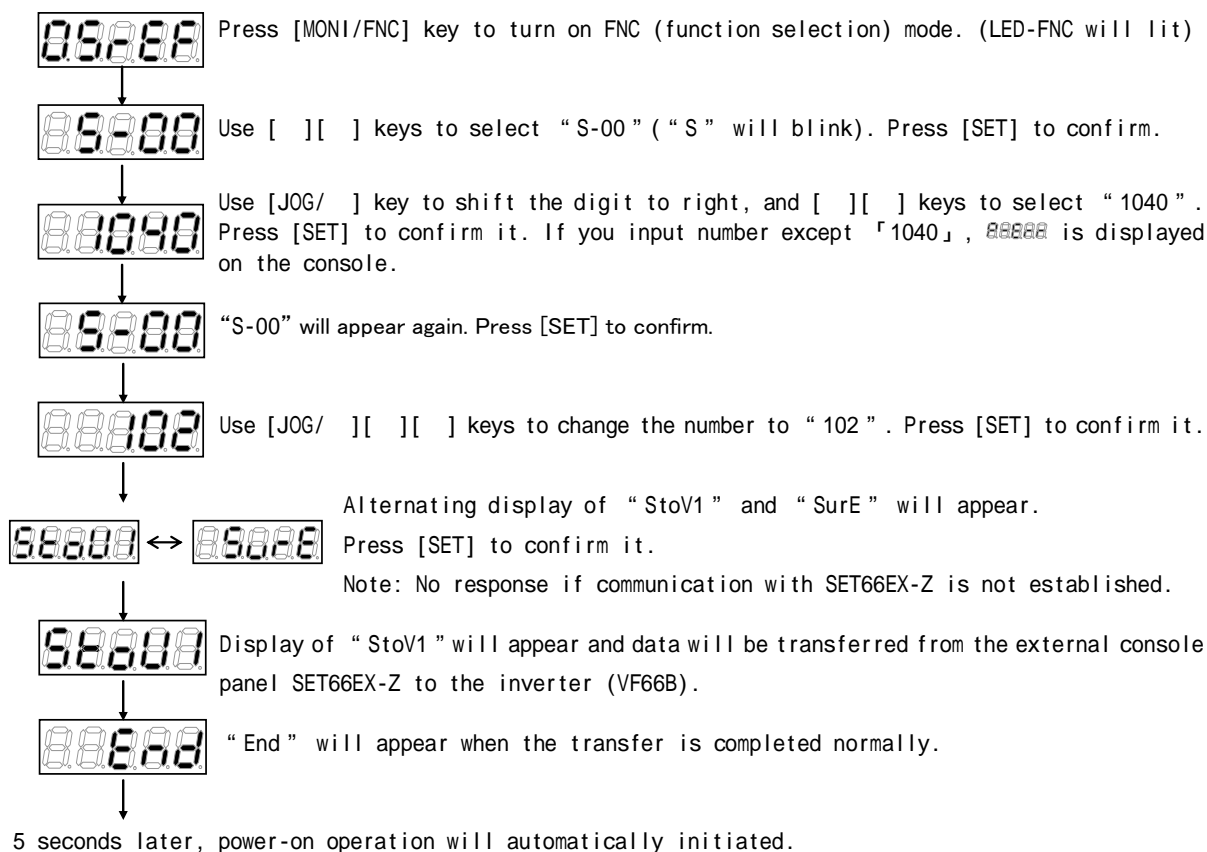
Copy of A-area setting data is not involved.

Note: Apply below method when inverter type or motor type is changed.



Connect optional external console panel SET66EX-Z with the console panel SET66-Z on the inverter VF66B.

If you connect external console panel SET66EX-Z to the VF66B, you cannot use console panel (SET66-Z) on the VF66B.



Note: If normal communication is disturbed during data transfer, the data transfer is discontinued and display will return to inverter mode indication or is discontinued 10 seconds after the blink

indication of 88888.

To resume the data transfer, please repeat the process from the beginning.

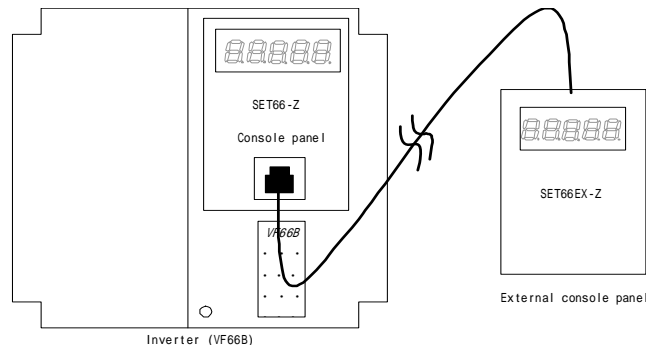
Note: When [SET] key is pressed after the alternating display of "StoV1" and "SurE" and if there is difference in software version number between the inverter and the one stored in the external console

panel, 88888 will blink. Data copy will be discontinued if [STOP/RESET] key is pressed during

the indication of 88888 and executed if [SET] key is pressed.

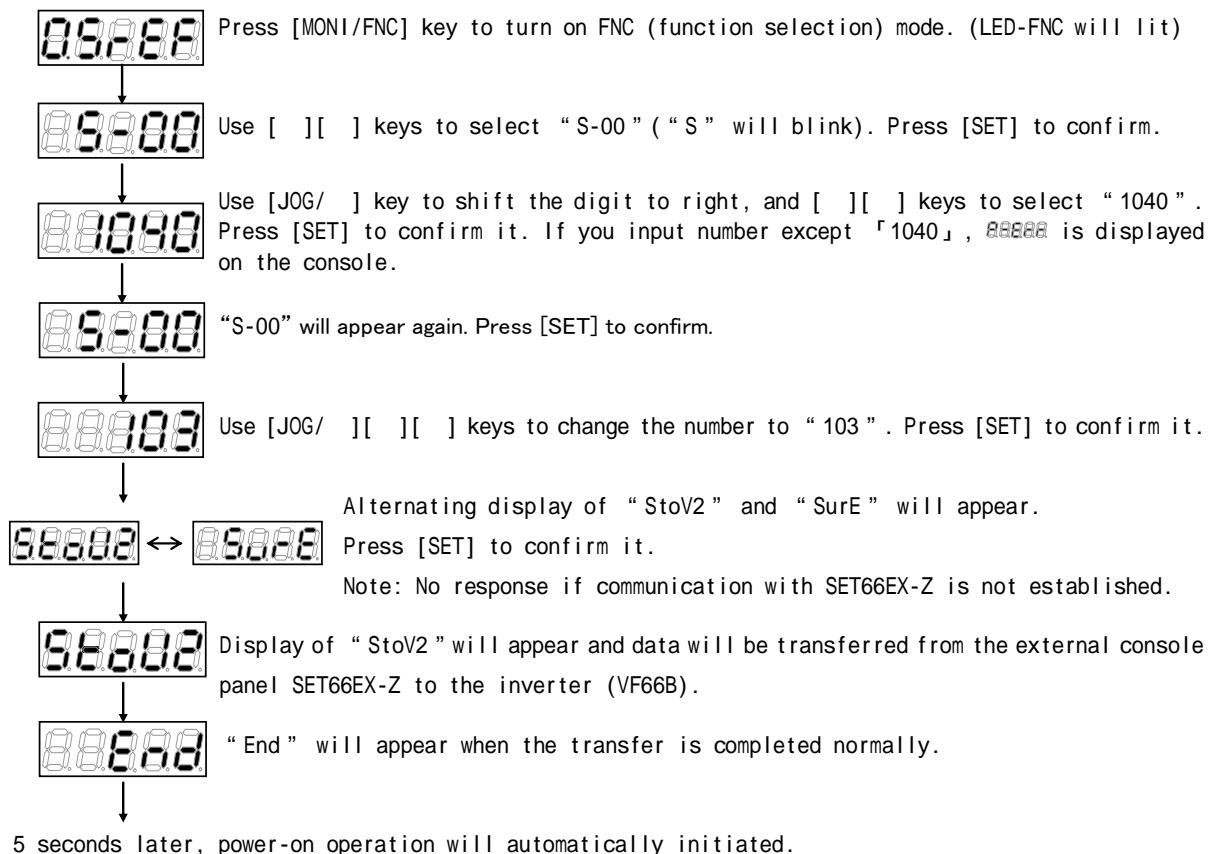
• Copy of setting data from the external console panel SET66EX-Z to the inverter (involving copy of A-area)
Data transferring method from the inverter (VF66B) to the external console panel SET66EX-Z is explained below.
Copy of A-area setting data is involved.

Note: Apply below method if both inverter type and motor type are same.



Connect optional external console panel SET66EX-Z with the console panel SET66-Z on the inverter VF66B.

If you connect external console panel SET66EX-Z to the VF66B, you cannot use console panel (SET66-Z) on the VF66B.

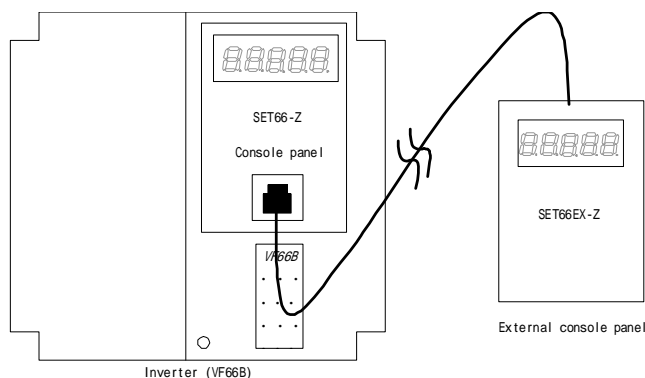


Note: If normal communication is disturbed during data transfer, the data transfer is discontinued and display will return to inverter mode indication or is discontinued 10 seconds after the blink indication of . To resume the data transfer, please repeat the process from the beginning.

Note: When [SET] key is pressed after the alternating display of "StoV2" and "SurE" and if there is difference in software version number between the inverter and the one stored in the external console panel, will blink. Data copy will be discontinued if [STOP/RESET] key is pressed during the indication of and executed if [SET] key is pressed.

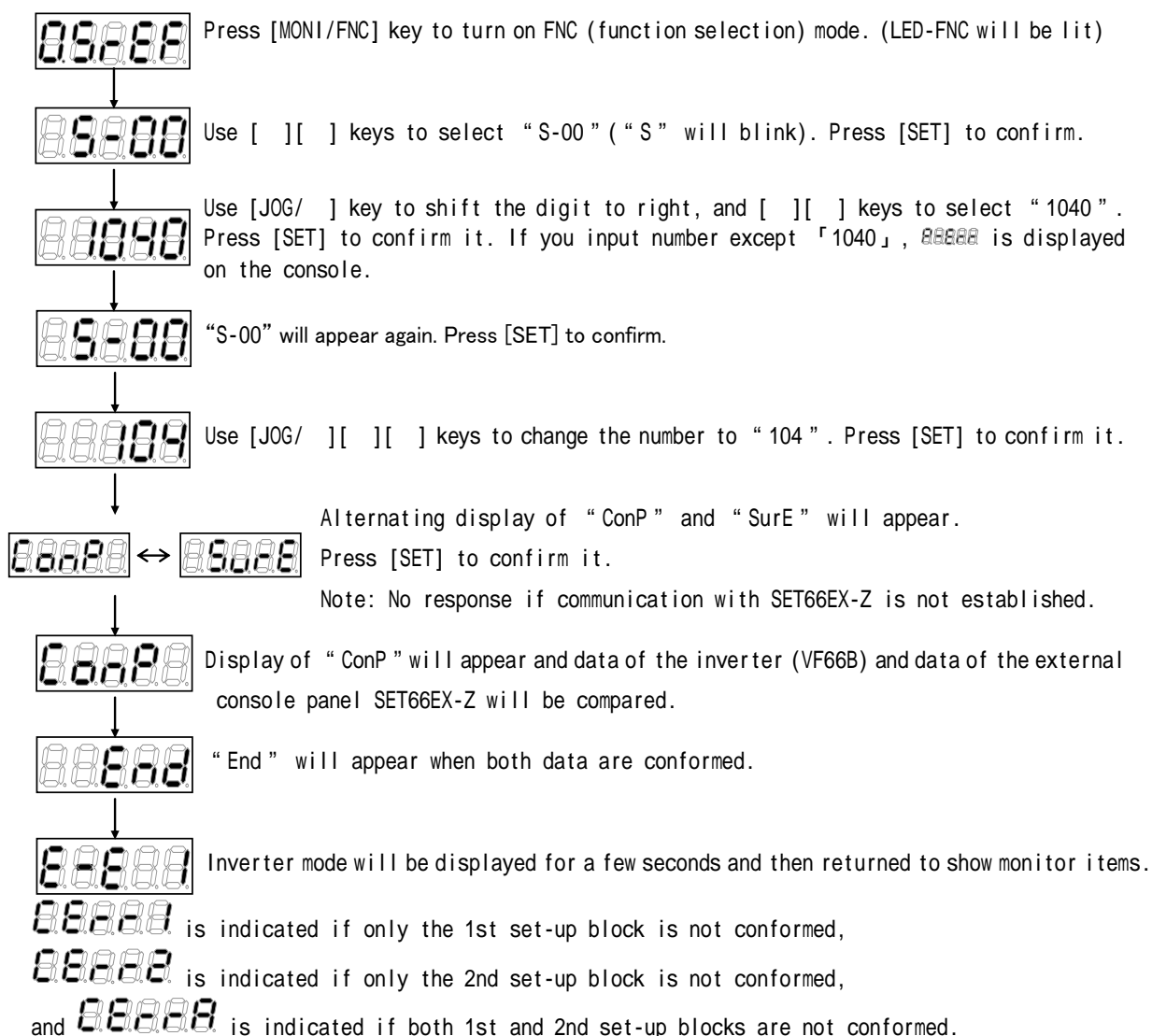
• Comparison between the data in the inverter (VF66B) and the data of the external console panel SET66EX-Z

Procedure of data comparison between the inverter (VF66B) and the external console panel SET66EX-Z is shown below:



Connect optional external console panel SET66EX-Z with the console panel SET66-Z on the inverter VF66B.

If you connect external console panel SET66EX-Z to the VF66B, you cannot use console panel (SET66-Z) on the VF66B.



Note: If normal communication is disturbed during data transfer, the data transfer is discontinued and display will return to inverter mode indication or is discontinued 10 seconds after the blink

indication of 00000.

To resume the data transfer, please repeat the process from the beginning.

Cumulative time timer clear

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
S-01	Cumulative operation timer (1) clear	1: Clearing Timer (1)			
S-02	Cumulative operation timer (2) clear	1: Clearing Timer (2)			

Count of the cumulative timer (1) can be cleared by setting “1” in the Cumulative timer (1) clear (S-01).

Similarly, count of the cumulative timer (2) can be cleared by setting “1” in the Cumulative timer (2) clear (S-02).

ROM rewritable switch

Display	Item	Set-up range (Item selection)	Set-up resolution	Default data	Unit
S-04	ROM rewritable switch	Rewriting of ROM will be possible by entering “1040” after the power is on.			

To transfer PLC function program to ROM, The ROM rewritable switch (S-04) must be set to “1”. For more information, please refer to <VF66 series PC Tool user manual>.

Vdc adjustment, analog gain and offset automatic adjustment

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
S-03	Vdc adjustment	Vdc value (V): Vdc detection gain adjust			
S-05					
S-06	Analog input (1) adjust	1: Analog input (1) offset adjustment Input analog input (1) voltage (V) $\times 1000$: Analog input (1) gain adjustment			
S-07	Analog output (1) adjust	1: Analog output (1) offset adjustment 2: Analog output (1) gain adjustment			
S-08	Analog input (2) adjust	1: Analog input (2) offset adjustment Input analog input (2) voltage (V) $\times 1000$: Analog input (2) gain adjustment			
S-09	Analog output (2) adjust	1: Analog output (2) offset adjustment 2: Analog output (2) gain adjustment			
S-10	Analog input (3) adjust	1: Analog input (3) offset adjustment Input analog input (3) voltage (V) $\times 1000$: Analog input (3) gain adjustment			
S-11	Analog output (3) adjust	1: Analog output (3) offset adjustment 2: Analog output (3) gain adjustment			
S-12	Analog input (4) adjust	1: Analog input (4) offset adjustment Input analog input (4) voltage (V) $\times 1000$: Analog input (4) gain adjustment			
S-13	Analog output (4) adjust	1: Analog output (4) offset adjustment 2: Analog output (4) gain adjustment			
S-14	Analog input (5) adjust	1: Analog input (5) offset adjustment Input analog input (5) voltage (V) $\times 1000$: Analog input (5) gain adjustment			
S-15	Analog output (5) adjust	1: Analog output (5) offset adjustment 2: Analog output (5) gain adjustment			

• Vdc detection gain automatic adjustment

Before adjusting Vdc detection gain, set a DC voltmeter or a tester between $\oplus 2 \sim \ominus$ of the inverter shown in the figure in <Instruction manual (installation) Chapter2 2.3 connecting method>, then turn ON the inverter.



CAUTION [For your safety]

- DC voltmeter or tester measurable of 500V+ (for 200V class) or 1000V+ (for 400V class) should be used for measuring DC voltage.
- High voltage will be impressed on the DC voltmeter or tester during measurement. Voltage measurement shall be carried on by technician.
- Turn the power ON after the front cover is closed. There is risk of electrical shock.

Vdc detection gain (L-00) is automatically changed by following procedure:



Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit)



Use [] [] keys to select "S-00" ("S" will blink).



Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to enter the number "03" (S-03) and press [SET] to confirm it.



Use [JOG/] key to shift the digit to right, and [] [] keys to select "1040". Press [SET] to confirm it. If you input number except "1040", 888888 is displayed on the console.



"S-03" will appear again. Press [SET] to confirm.



Use [JOG/] [] [] keys to input the measured value of the voltmeter or tester installed on the inverter, then press [SET] to confirm it.



If "S-03" appears again, Vdc detection gain (L-00) will be automatically changed. Press [MONI/FNC] to indicate monitor items.

• Adjustment of Analog input (1) gain (L-01) and Analog input (1) offset (L-02)

Followings are the changing procedure of Analog input (1) gain (L-01) and Analog input (1) offset (L-02).



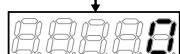
Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit)



Use [] [] keys to select "b-00" ("b" will blink).



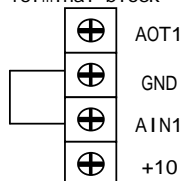
Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to enter the number "17" (b-17) and press [SET] to confirm it.



Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to input "0". Press [SET] to confirm it.

P board (VFC66-Z)

Terminal block



Turn OFF the inverter, open the front cover, and short circuit between terminals [AIN1] and [GND] on the terminal block of the printed board (VFC66-Z).



CAUTION [Short circuiting of terminals]

Before short circuiting terminals, please be sure to turn OFF the inverter.
There is a risk of electrical shock.



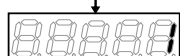
After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit). Use [JOG/] [] [] keys to select "S-06" then press [SET] to confirm it.



Use [JOG/] [] [] keys to input "1040" then press [SET] to confirm it. If you input number except "1040", 00000 is displayed on the console.



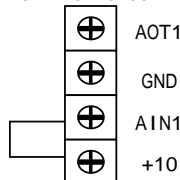
"S-06" will appear again. Press [SET] to confirm.



Use [JOG/] [] [] keys to select "1" then press [SET] to confirm it.

P board (VFC66-Z)

Terminal block

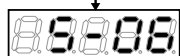


Turn OFF the inverter, open the front cover, and short circuit between terminals [AIN1] and [+10] on the printed board (VFC66-Z).



CAUTION [Short circuiting of terminals]

Before short circuiting terminals, please be sure to turn OFF the inverter.
There is a risk of electrical shock.



• After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit). Use [JOG/] [] [] keys to select "S-06" then press [SET] to confirm it.



• Use [JOG/] [] [] keys to input "1040" then press [SET] to confirm. If you input number except "1040", 00000 is displayed on the console.



• "S-06" will appear again. Press [SET] to confirm.

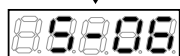


Measure the voltage between terminals [AIN1] and [GND] with a tester and enter the 1000 times of the measured value. If measurement is not available, the value "9930" can be used, however, accuracy is inferior.



CAUTION [Voltage measurement]

When the voltage between the terminals is measured, please be sure not to touch wirings or terminals. There is a risk of electrical shock.



If "S-06" appears again, Analog input (1) gain (L-01) and Analog input (1) offset (L-02) will be changed automatically.

Press [MONI/FNC] to indicate monitor items.

When adjustment is done, turn OFF the inverter, open the front cover, and remove the short circuit wirings installed between terminals [AIN1] and [+10] of VFC66-Z P board.

• Adjustment of Analog input (1) gain (L-01) (when input characteristic of 4 to 20mA)

Note: Adjustment of Analog input (1) gain (L-01) and Analog input (1) offset (L-02) in 0-10V is required before this adjustment.



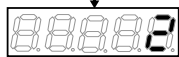
Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit)



Use [] [] keys to select "b-00" ("b" will blink).

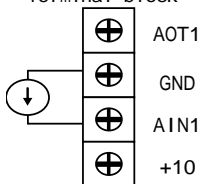


Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to enter the number "17" (b-17) and press [SET] to confirm it.



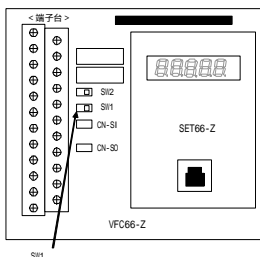
[Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to input "2". Press [SET] to confirm it.

P board (VFC66-Z)
Terminal block



Turn OFF the inverter, open the front cover, connect current power between terminals [AIN1] and [GND] on the terminal block of printed board (VFC66-Z).

Turn the SW1 ON (terminal block side) while the power of inverter is OFF.



CAUTION [Connection of current power]

Before connecting current power, please be sure to turn OFF the inverter.

There is a risk of electrical shock.

Please be sure to turn OFF the inverter before switching a switch.

There is a risk of electrical shock.

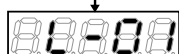


• After power is ON, select "Vin" with [] [] keys of monitor items.



• Turn the current power ON, and apply the current of 20mA to [AIN1] terminal.

• A number will be displayed.



• Adjust the value of L-01 so that the value of monitor item "Vin" becomes "10.00".

Note: For display of the monitor item "Vin", the item displayed can be changed by changing setting of Analog input monitor display selection (G-16). For more information, please refer to Chapter4 4.8 G-area.

When adjustment is done, remove the current power.

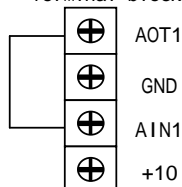
• Adjustment of Analog output (1) gain (L-03) and Analog output (1) offset (L-04)

Note: Adjustment of Analog input (1) offset and gain is required before this adjustment.

Followings are the changing procedure of Analog output (1) gain (L-03) and Analog output (1) offset (L-04).

P board (VFC66-Z)

Terminal block



Turn OFF the inverter, open the front cover, and short circuit between terminals [AOT1] and [AIN1] on the terminal block of the printed board (VFC66-Z).



CAUTION [Short circuiting of terminals]

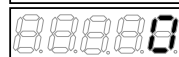
Before short circuiting terminals, please be sure to turn OFF the inverter.
There is a risk of electrical shock.



After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit).



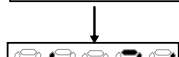
• Use [JOG/] [] [] keys to select “b-17” then press [SET] to confirm it.



• Use [JOG/] [] [] keys to input “0” and press [SET] to confirm it.



• “b-17” will appear again.



• Use [JOG/] [] [] keys to select “b-21” then press [SET] to confirm it.



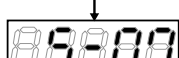
• Use [JOG/] [] [] keys to input “0” and press [SET] to confirm it.



• “b-21” will appear again.



• Use [JOG/] [] [] keys to select “S-07” then press [SET] to confirm it.



• Use [JOG/] [] [] keys to input “1040” then press [SET] to confirm it. If you input number except 「1040」, **00000** is displayed on the console.



• “S-07” will appear again. Press [SET] to confirm.



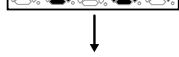
• Use [JOG/] [] [] keys to input “1” and press [SET] to confirm it.



• “S-07” will appear again.



• Use [JOG/] [] [] keys to select “b-21” then press [SET] to confirm it.



• Use [JOG/] [] [] keys to input “6” then press [SET] to confirm it.



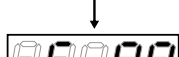
• “b-21” will appear again.



• Use [JOG/] [] [] keys to select “S-07” then press [SET] to confirm it.



• Use [JOG/] [] [] keys to input “1040” then press [SET] to confirm it. If you input number except 「1040」, **00000** is displayed on the console.



• “S-07” will appear again. Press [SET] to confirm.



• Use [JOG/] [] [] keys to input “2” then press [SET] to confirm it.



• If “S-07” appears again, Analog output (1) gain (L-03) and Analog output (1) offset (L-04) will be changed automatically.




When adjustment is done, turn OFF the inverter, open the front cover, and remove the short circuit wirings installed between terminals [AOT1] and [AIN1] of VFC66-Z P board.

• Adjustment of offset and gain of Analog input (2) through (5)

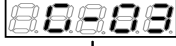
Note: Optional IO66-Z, IOEXT66-Z or Communication option boards are required for Analog input (2) through (5). This setting is unnecessary if IO66-Z, IOEXT66-Z or Communication option board is not used. Also adjustment of Analog input (1) offset and gain is required before this adjustment.

Followings are changing procedure of Analog input (2) - (5) gain and Analog input (2) - (5) offset.


Only changing procedure of Analog input (2) gain/offset (L-05/L-06) is shown here. For gain/offset of Analog input (3) through (5), set the setting items in G-area and S-area to be compatible with Analog input (3) through (5) then follow the same procedure as Analog input (2).



Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit)

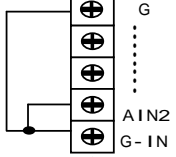


Use [] [] keys to select "G-03" *1 and press [SET] to confirm it.



Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to input "0". Press [SET] to confirm it.

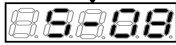
P board (VFC66-Z)




Turn OFF the inverter, open the front cover, and short circuit between terminals [AIN2]-[G]-[G-IN] on the terminal block of option P board (IO66-Z).

CAUTION [Short circuiting of terminals]


Before short circuiting terminals, please be sure to turn OFF the inverter.
There is a risk of electrical shock.




After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit). Use [JOG/] [] [] keys to select "S-08" *2 then press [SET] to confirm it.



Use [JOG/] [] [] keys to input "1040" then press [SET] to confirm it. If you input number except "1040", 0.0000 is displayed on the console.

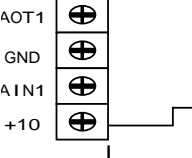


"S-08" *2 will appear again. Press [SET] to confirm.

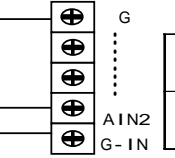


Use [JOG/] [] [] keys to select "1" then press [SET] to confirm it.

board (VFC66-Z)




P board (IO66-Z)



Turn OFF the inverter, open the front cover, and short circuit between [AIN2] terminal of the printed board (IO66-Z) and [+10] terminal of the printed board (VFC66-Z). Remain short circuited terminals between [G] and [G-IN] of the printed board (IO66-Z).

CAUTION[Short circuiting of terminals]


Before short circuiting terminals, please be sure to turn OFF the inverter.
There is a risk of electrical shock.



• After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit). Use [JOG/] [] [] keys to select "S-08" *2 then press [SET] to confirm it.

• Use [JOG/] [] [] keys to input "1040" then press [SET] to confirm. If you input number except "1040", 0.0000 is displayed on the console.


• "S-08" *2 will appear again. Press [SET] to confirm.



Measure the voltage between terminals [AIN1] and [GND] with a tester and enter the 1000 times of the measured value. If measurement is not available, the value "9930" can be used, however, accuracy is inferior.

CAUTION [Voltage measurement]

When the voltage between the terminals is measured, please be sure not to touch wirings or terminals. There is a risk of electrical shock.



If "S-08" *2 appears again, Analog input (2) gain (L-05)*3 and Analog input (2) offset (L-06)*3 will be changed automatically. Press [MONI/FNC] to indicate monitor items.

When adjustment is done, turn OFF the inverter, open the front cover, and remove the short circuit wirings installed between terminals [AIN2] on the IO66-Z P board and [+10] on the VFC66-Z P board, as well as [G] and [G-IN] on the IO66-Z P board.

*1: For Analog input (3) through (5), please refer to Chapter4 4.8 G-area and set corresponding items.

*2: For Analog input (3) through (5), please refer to Chapter4 4.16 S-area and set corresponding items.

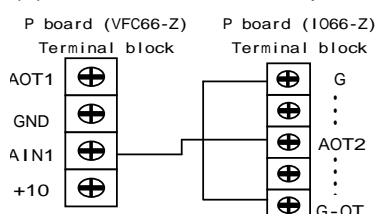
*3: For Analog input (3) through (5), please refer to Chapter4 4.12 L-area and set corresponding items.

• Adjustment of offset and gain of Analog output (2) through (5)

Note: Optional IO66-Z, IOEXT66-Z or Communication option boards are required for Analog output (2) through (5). This setting is unnecessary if IO66-Z, IOEXT66-Z or Communication option board is not used. Also adjustment of Analog input (1) offset and gain is required before this adjustment.

Followings are changing procedure of Analog input (2) - (5) gain and Analog output (2) - (5) offset.

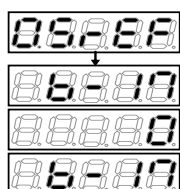
Only changing procedure of Analog output (2) gain/offset (L-05/L-06) is shown here. For gain/offset of Analog output (3) through (5), set the setting items in G-area and S-area to be compatible with Analog output (3) through (5) then follow the same procedure as Analog output (2).



Turn OFF the inverter, open the front cover, and short circuit between terminals [AOT2] on the printed board (IO66-Z) and [AIN1] on the printed board (VFC66-Z) as well as [G] and [G-OT] on the printed board (IO66-Z).
Note: Use terminal [AIN1] as an analog input when setting Analog output (3) through (5).

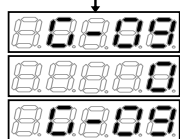
CAUTION [Short circuiting of terminals]

Before short circuiting terminals, please be sure to turn OFF the inverter.
There is a risk of electrical shock.

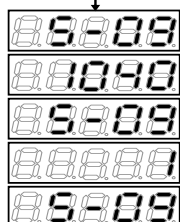


After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit).

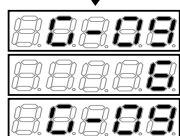
- Use [JOG/] [] [] keys to select "b-17" then press [SET] to confirm it.
- Use [JOG/] [] [] keys to input "0" and press [SET] to confirm it.
- "b-17" will appear again.



- Use [JOG/] [] [] keys to select "G-09" *1 then press [SET] to confirm it.
- Use [JOG/] [] [] keys to input "0" then press [SET] to confirm it.
- "G-09" will appear again.



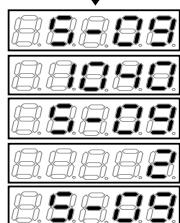
- Use [JOG/] [] [] keys to select "S-09" *2 then press [SET] to confirm it.
- Use [JOG/] [] [] keys to input "1040" then press [SET] to confirm it. If you input number except "1040", 00000 is displayed on the console.
- "S-09" *2 will appear again. Press [SET] to confirm.
- Use [JOG/] [] [] keys to input "1" and press [SET] to confirm it.
- "S-09" *2 will appear again.



• Use [JOG/] [] [] keys to select "G-09" *1 then press [SET] to confirm it.

Note: For Analog output (3) - (5), change the number accordingly.

- Use [JOG/] [] [] keys to input "6" then press [SET] to confirm it.
- "G-09" *1 will appear again.



- Use [JOG/] [] [] keys to select "S-09" *2 then press [SET] to confirm it.
- Use [JOG/] [] [] keys to input "1040" then press [SET] to confirm it. If you input number except "1040", 00000 is displayed on the console.
- "S-09" will appear again. Press [SET] to confirm.
- Use [JOG/] [] [] keys to input "2" then press [SET] to confirm it.
- If "S-09" *2 appears again, Analog output (2) gain (L-09) *3 and Analog output (2) offset (L-10) *3 will be changed automatically.
- Press [MONI/FNC] to indicate monitor items.

When adjustment is done, turn OFF the inverter, open the front cover, and remove the short circuit wirings installed between terminals [AOT2] on the IO66-Z P board and [AIN1] on the VFC66-Z P board as well as [G] and [G-OT] on the IO66-Z P board.

*1: For Analog input (3) through (5), please refer to Chapter4 4.8 G-area and set corresponding items.

*2: For Analog input (3) through (5), please refer to Chapter4 4.16 S-area and set corresponding items.

*3: For Analog input (3) through (5), please refer to Chapter4 4.12 L-area and set corresponding items.

Chapter5 Replacement of control board VFC66-Z

5.1. Replacement of control printed board VFC66-Z with stock parts

When the control printed board VFC66-Z is replaced with stock parts, setting of inverter capacity, motor rate (value on the plate), automatic tuning data and gain adjustment of the analog circuit are required in order to match the parts with the inverter currently using.

5.2. Replacement of control printed board VFC66-Z



CAUTION [Replacement of printed board VFC66-Z]

Please be sure to turn OFF inverter before opening or closing front cover.
There is risk of electrical shock.

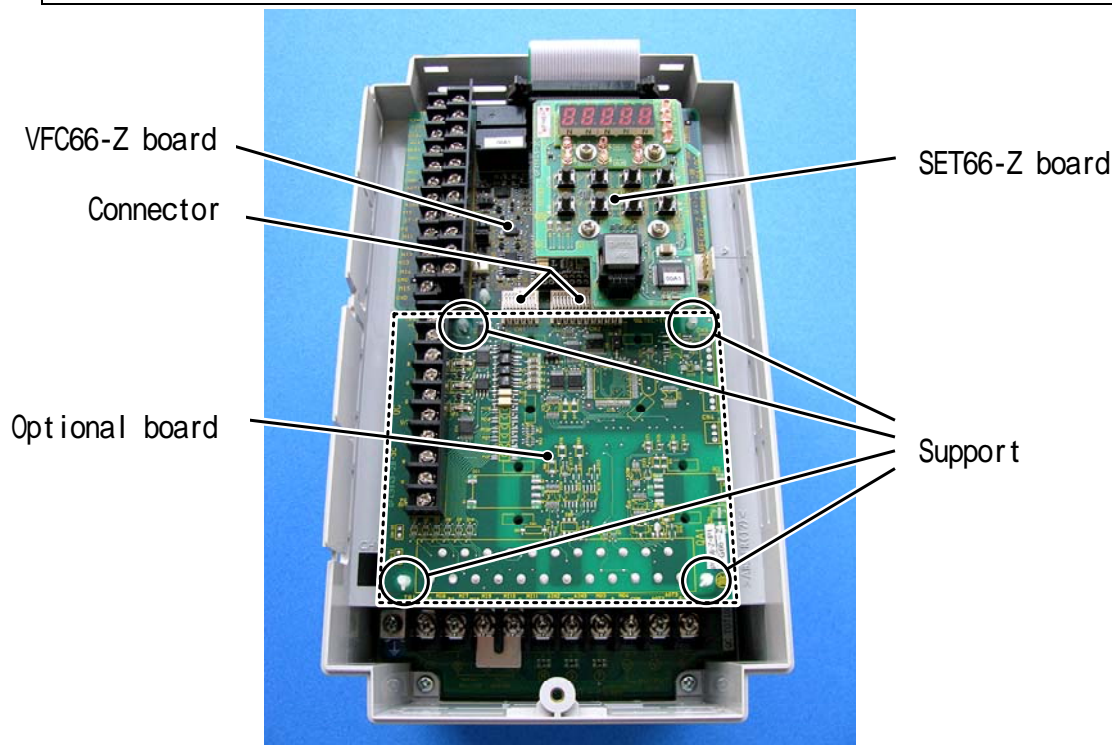


Fig.5.1 Inverter removed front cover (VF66B-2R222)

Open the front cover.

(Please refer to instruction manual (installation) Chapter2 2.2
<Opening / closing of front cover>)

Remove SET66-Z board. Remove 4 screws indicated by circles in the right figure, and pull out SET66-Z board from the VFC66-Z board.

Remove optional board. Disconnect two connectors located between VFC66-Z board and option board. Fig.5.3 (a) is showing the condition with connectors connected. As shown in Fig.5.3 (b), pull the knob of the connector upward to disengage connection.

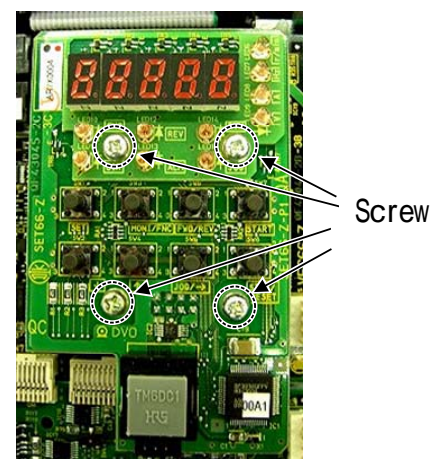


Fig.5.2 SET66-Z board

There are four supports indicated by circles in Fig.5.1 which fixes the option board to the inverter. Remove the option board while pushing the latch of the support.

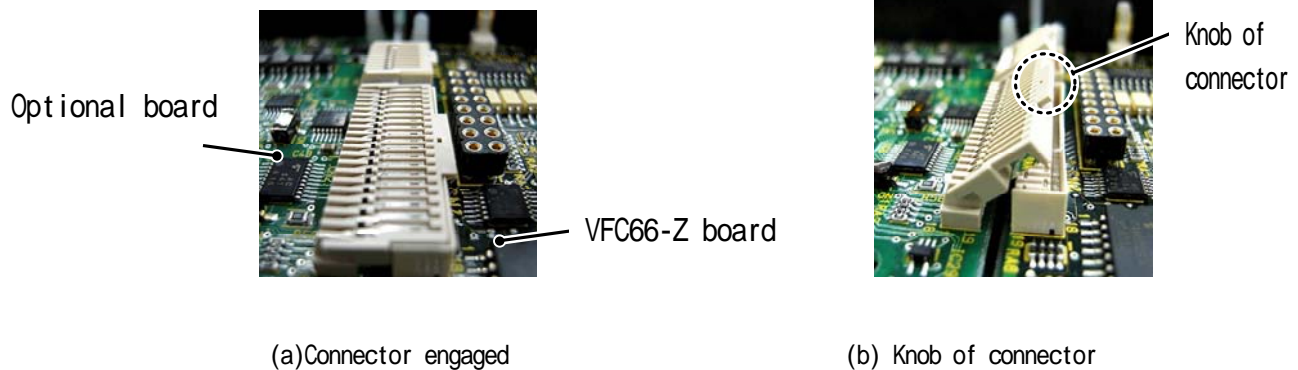


Fig.5.3 Connector

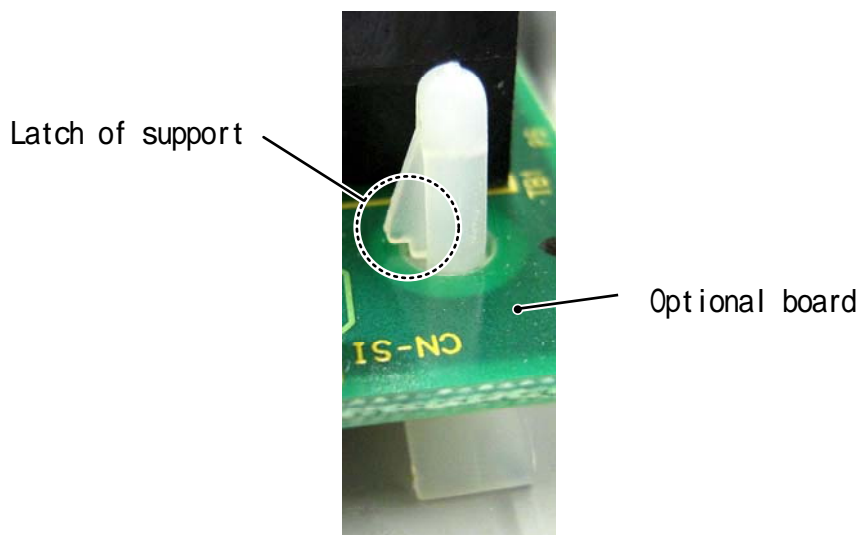


Fig.5.4 Latch of support

Like above mentioned option board, VFC66-Z board also has supports to fix the board to the inverter. Remove the VFC66-Z board while pushing the latch of the support. Align four holes with four supports, push the board downward until latches lock the board as shown in Fig.5.4.

Align four holes of the option board with four supports circled in Fig.5.1 and push the board downward until latches lock the board as shown in Fig.5.4.

Push the knob of connectors CN1 and CN2 on the option board downward, align them with the connector CN7 and CN4 of the VFC66-Z board respectively and connect them (refer to Fig.5.3 (a) and (b)). Because of the elasticity of the connector, connection may come off if connection is inadequate. Please connect the connector firmly.

Install back the SET66-Z board again.

Put the cover of the inverter back again.

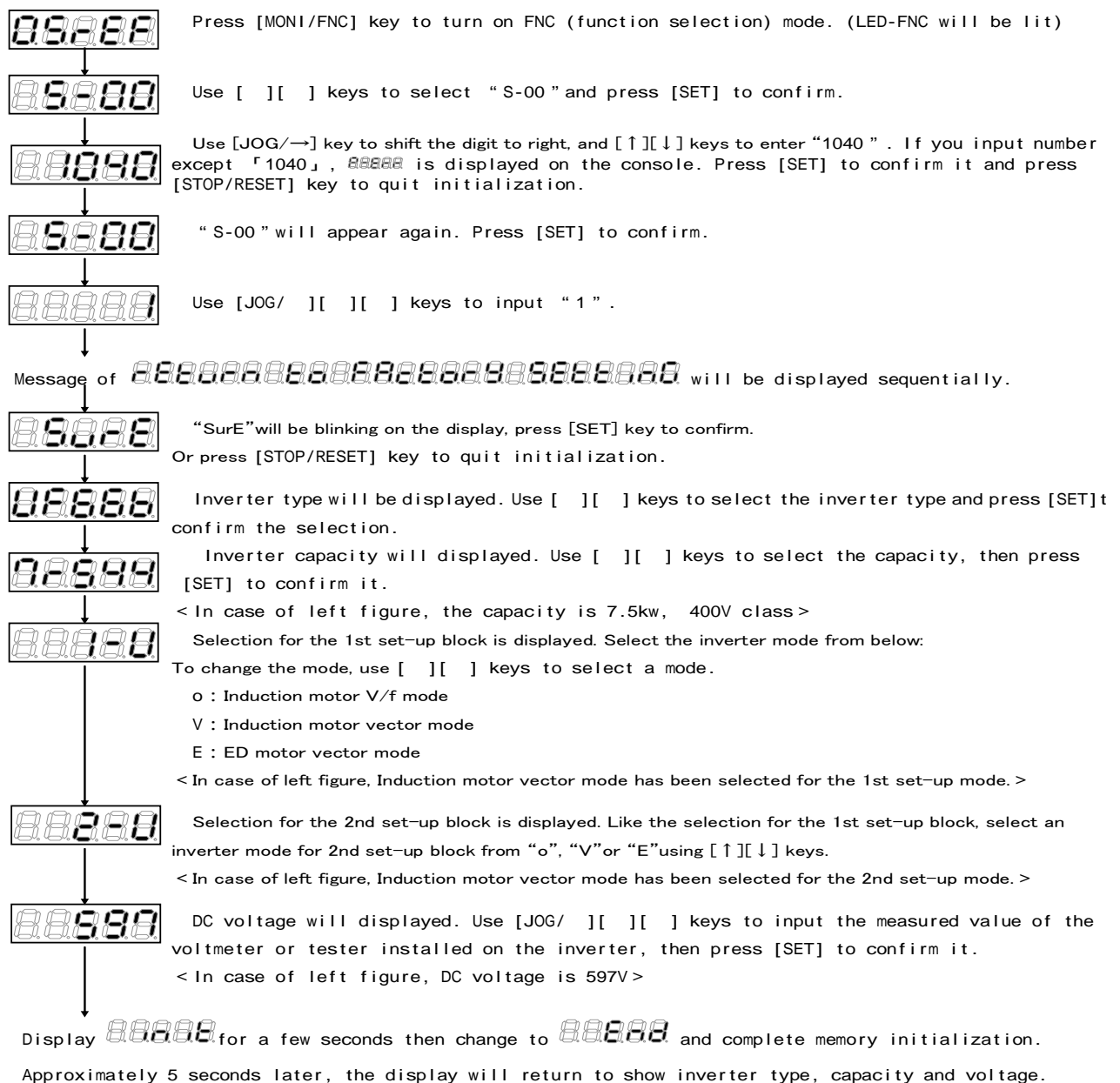
5.3. Initialization of VF66B

Capacity setting of VF66B can be set by initializing the inverter. Followings are concrete procedure of the setting.

Before initializing the inverter, install a DC voltmeter or a tester between \oplus 2- \ominus of the inverter shown in the figure in the instruction manual (installation) Chapter2 2.3 <Connecting method> and then turn ON the inverter.

CAUTION [For your safety]

- DC voltmeter or tester measurable of 500V+ (for 200V class) or 1000V+ (for 400V class) should be used for measuring DC voltage.
- High voltage will be impressed on the DC voltmeter or tester during measurement. Voltage measurement shall be carried on by technician.
- Turn the power ON after the front cover is closed. There is risk of electrical shock.



5.4. Adjustment of Analog input gain

Following items are for adjustment of analog input gain:

Display	Items	Set-up range (Item selection)	Set-up resolution	Default data	Unit
L-01	Analog input(1) gain	50.00 to 150.00	0.01	Adjusted	%
L-02	Analog input(1) offset	-50.00 to 50.00	0.01	Adjusted	%

Analog input (1) gain (L-01) and Analog input (1) offset (L-02) can be changed by following procedure:



Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit)



Use [] [] keys to select "b-00" ("b" will blink).

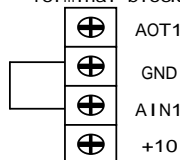


Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to enter the number "17" (b-17) and press [SET] to confirm it.



[Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to input "0". Press [SET] to confirm it.

P board (VFC66-Z)
Terminal block

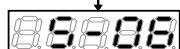


Turn OFF the inverter, open the front cover, connect current power between terminals [AIN1] and [GND] on the terminal block of printed board (VFC66-Z).



CAUTION [Short circuiting of terminals]

Before short circuiting terminals, please be sure to turn OFF the inverter.
There is a risk of electrical shock.



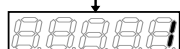
After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. Use [JOG/] [] [] keys to select "S-06" and press [SET] to confirm it.



Use [JOG/] [] [] keys to input "1040" then press [SET] to confirm it. If you input number except "1040", 88888 is displayed on the console.

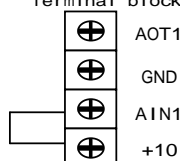


"S-06" will appear again. Press [SET] to confirm.



Use [JOG/] [] [] keys to input "1" and press [SET] to confirm it.

P board (VFC66-Z)
Terminal block



Turn OFF the inverter, open the front cover, and short circuit between terminals [AIN1] and [+10] on the terminal block of the printed board (VFC66-Z).

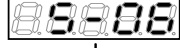


CAUTION [Short circuiting of terminals]

Before short circuiting terminals, please be sure to turn OFF the inverter.
There is a risk of electrical shock.



- After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit). Use [JOG/] [] [] keys to select "S-06" then press [SET] to confirm it.
- Use [JOG/] [] [] keys to input "1040" then press [SET] to confirm it. If you input number except "1040", 88888 is displayed on the console.
- "S-06" will appear again. Press [SET] to confirm.

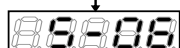


Measure the voltage between terminals [AIN1] and [GND] with a tester and enter the 1000 times of the measured value. If measurement is not available, the value "9930" can be used, however, accuracy is inferior.



CAUTION [Voltage measurement]

When the voltage between the terminals is measured, please be sure not to touch wirings or terminals. There is a risk of electrical shock.

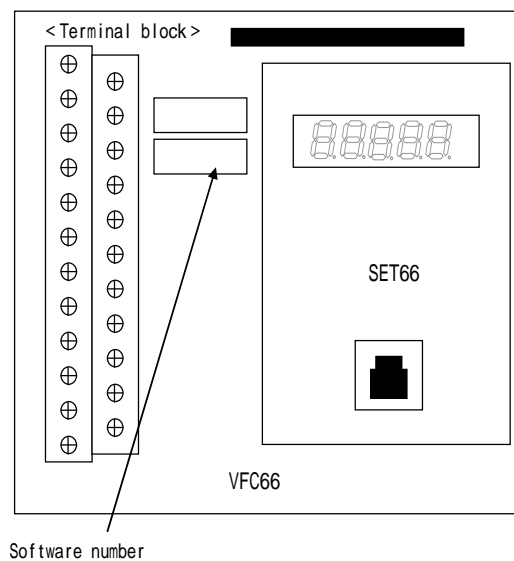


If "S-06" appears again, Analog input (1) gain (L-01) and Analog input (1) offset (L-02) will be changed automatically.

Chapter6 Spare parts and technical assistance

Please let us know following information when you ordering spare parts or requesting technical assistance.

- 1) Inverter type, capacity (kW) and input voltage (V)
- 2) Motor type, capacity (kW), rated motor speed (rpm), rated motor voltage and pole number of the motor
- 3) Serial number and software version number (Software number can be find on the label pasted on the control printed board VFC66-Z as shown in the figure below.)



- 4) Situation at the failure and description of failure.
- 5) Operational status, load condition, environmental condition and date of purchase
- 6) Name of dealer or sales representative department

Our request to dealers

When your product using this inverter is shipped, please make sure so that this instruction manual is deliver to your end user.

Also, if the setting value of this inverter has been changed from the factory default value, please notify the change to the end user.

TOYODENKI SEIZO K.K.

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FAX : +81-3-3535-0660

OSAKA BRANCH : Higashi Hankyu Bldg. Kakuta-cho 1-1,
Kita-ku Osaka, Japan ZIP CODE 530-0017

TEL : +81-6-6313-1301

FAX : +81-6-6313-0165

NAGOYA BRANCH : Toyo Bldg., 14-16, Meieki 3-chome
Nakamura-ku, Nagoya, Japan. ZIP CODE 450-0002

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